

## **Page A.     Inspection of Raw Product Receiving, Storage, and Quality Program. (Form DA - 151 - 1)**

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Especially detailed guidelines are shown for Items 1 through 15 and Items 24 through 40. These particular inspection factors are cross referenced instead of repeating the information on other survey pages.

### **Receiving—Cans**

#### **Item A1—Room Construction (58.126, 58.131).**

Rooms or areas for receiving can milk shall be separated from the processing rooms by a solid partition or by suitable arrangement of equipment with enough distance between receiving and processing operations to avoid possible contamination of milk or dairy products during manufacturing and handling.

Check the can inlet and outlet openings for effective protection against entrance of flies or rodents. If possible, inspect the openings when conveyor lines are idle to determine if self-closing doors fit tightly. Some older installations have doors that do not effectively block off open areas beneath the conveyor chain. If this is the case, recommend modification or replacement to obtain effective rodent protection.

Fly fans, fly tunnels, streamers, or other devices may be used to prevent entrance of flies in this area. The adequacy of the method used can be evaluated by noting if flies are present in the room. When flies or other insects are noted, refer to the guidelines for Item A37—Pest Control in reporting deficiencies and recommended corrections.

Toilet rooms shall not open directly into any room in which milk or dairy products are processed, packaged or stored. One way to correct this is to add a vestibule with an additional self-closing door.

#### **A.     Floors (58.126c).**

The floors of all rooms in which milk or dairy products are processed, manufactured, packaged or stored or in which utensils are washed shall be constructed of tiles properly laid with impervious joint material, concrete, seamless epoxy, or other equally impervious material. The floors shall be smooth, kept in good repair, graded so that there will be no pools of standing water or milk products.

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Examine the floor for slope, condition, and cleanliness, noting cracks, broken or eroded concrete, missing grouting, poor drainage, or general deterioration. Recommend repair or replacement as may be applicable based on the condition.

Loose floor tiles or loose floor topping materials are especially serious conditions. Water and other liquid wastes can seep underneath (floating floors) and create areas of insect or bacterial harborage and bad odors. If noted, recommend correction.

### B. Floor Drains (58.126c).

Floor drains should be so located and sized so that the normal volume of liquid waste is promptly carried away.

Properly trapped floor drains are essential to prevent possible off odors and contamination of plant air. Drains shall be kept clean and be individually protected with an effective trap. A central trapping system without individual drain traps is unsatisfactory because odors and airborne contamination could originate from sewer pipes located between untrapped drains. Trench drains that are often found in receiving rooms are acceptable provided they are trapped at the outlet.

Bell and standpipe type traps in good condition will meet minimum USDA requirements, however, they require much maintenance. Therefore, check that standpipes are of proper length and that bells are in good condition and properly attached. Recommend replacement of any broken bells or drain covers. When broken or corroded standpipes are noted, recommend replacement with a "U" or "P" type trap.

U or P traps can be discerned by the water level in the drain pipe and need only to be inspected for cleanliness.

All new construction shall be equipped with U or P type traps unless specifically authorized by the Dairy Grading Branch.

Floor drain covers should be removable to permit cleaning of the drain area as needed. Welding covers in place is not satisfactory. If covers or drains in processing rooms are dirty, recommend more frequent cleaning.

Drains from elevated metal work decks for fluid product storage or processing operations should have traps located as close as practical to the deck drain and the drain pipes should be directly connected into the sanitary sewer system. Such traps and sewer connections are necessary to conduct fluid floor wastes out of the plant in a sanitary manner. It is unsatisfactory if deck drains are untrapped or the drain pipes discharge to the floor below. However, do not criticize lack of drain traps or sewer connections for the following types of decks:

1. Low platforms or decks with short straight drain pipes that can be easily cleaned.  
Example: Milk graders or dumpers platforms in can receiving rooms. If such pipes are causing off-odors, recommend cleaning.

2. Decks in nonproduct areas that are usually maintained in dry condition and seldom require wet cleaning. Examples: Steel decks around drier fans or secondary collectors, etc.
3. Decks in product processing areas that are normally free of fluid product wastes (e.g., operating decks for some evaporators, which are usually wetted only with water or cleaning solutions).

Drain pits or sumps for the sanitary sewer system that are located within the plant shall have tight fitting covers to prevent escape of odors. Covers may be gasketed, set in a bed of caulking material, or otherwise sealed to the opening with appropriate fastening devices. Recommend corrections where needed.

Processing rooms for margarine and butteroil and packaging rooms for margarine, butteroil, and butter are often required to have a grease trap by plumbing codes or municipal sewage-related regulations. The grease trap usually consists of a covered masonry pit to which the floor wastes are piped direct. The outlet piping from the pit is trapped and is so designed to keep a water level in the pit. The fat rises to the top and must be cleaned out periodically. This type of grease pit may serve instead of individual drain traps for the rooms listed above, subject to the following requirements:

1. Preferably the pit should be outdoors. However, if located inside the plant, the pit shall have a tight fitting cover and the required periodic cleaning shall not be conducted while processing operations are underway. If the pit location inside the plant is near processing operations or if unsanitary conditions are caused by the cleaning operations, recommend relocation outside the plant.
2. The drain lines shall enter the pit below the normal water level—thereby providing a seal against air flow from the pit to the processing room.
3. The outlet line from the pit to the sewer shall be trapped as close as practical to the pit.

When these requirements are met, the drain system should be shown as satisfactory on the report.

When floor drains are in a little-used area, water may evaporate from the trap, causing it to lose its “seal.” For such drains, recommend a nonevaporating type liquid (mineral oil, ethylene glycol) be added to prevent evaporating, or a plug or cap can be used to maintain an effective seal.

#### C. Walls, Partitions, Posts, & Ceilings (58.126a, b).

Inspect these surfaces for condition and cleanliness. Make recommendations as may be applicable for unsatisfactory conditions such as peeling paint, needed repairs, unsanitary conditions, or unsealed permeable surfaces, etc. These surfaces should be light colored and impervious to allow for easy cleaning.

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For new construction, recommend provision of a rounded cove at the juncture of wall and floor (a “should” item; coving is desirable for easier cleaning, but is not required for new plant approval).

So called “dropped ceilings” are satisfactory in office space, laboratories, and similar areas without particular inspection concern about the materials or construction. However, when processing rooms have such ceilings, check for the following:

1. Support rails free of rust or peeling paint (they are often made of aluminum or have special coatings to prevent corrosion).
2. Panels are removable to allow inspection of the false area above. Alternatively, the ceiling may be strongly supported and the enclosed area is deep enough to permit access on catwalks for inspection purposes, changing light bulbs, etc.
3. Ceiling panels are smoothly finished with a suitable material of light color, which is impervious to moisture and kept clean.
4. Edges of panels are also finished or sealed to prevent absorption and so that loose fibers do not fall into the room.

When deficiencies are noted regarding these items, recommend correction. Also, review the guidelines for Item A37–Pest Control.

Certain kinds of perforated ceiling panels are sometimes used for their acoustical qualities. This type of ceiling should be discouraged because the perforations are not desirable from a sanitary standpoint. However, if they are specially coated or enveloped to permit cleaning when they become dirty, are in good condition, and are clean, show as satisfactory. If in damaged or dirty condition, recommend cleaning or replacement of the unsatisfactory panels.

### D. Doors & Windows (58.126a).

§58.126a requires that all outer doors shall effectively protect against the entrance of flies and other insects, rodents, birds, dust and dirt. Therefore, doors and windows shall be adequately screened and fit properly. Exterior screen doors shall open outward.

Strip curtains alone cannot provide the protection necessary to serve as exterior doors. They are better suited for slowing air flow through interior doors or passageways. When strip curtains are being used as exterior doors, recommend that they be replaced with a properly fitting, solid door and limit the plant status to Approved-3 Months (category B deficiency). If the strip curtain door has not been replaced by the next inspection, the INELIGIBLE status will apply (category A deficiency). In addition, if only strip curtains are used between a processing or packaging room and other rooms in the plant, recommend a solid door be provided, and assign this deficiency to category D.

Wood or iron frame windows are satisfactory if in good condition. However, when noted with peeling paint, deteriorated frames, missing putty, etc., recommend needed repairs or replacement. Elimination of windows is also a satisfactory alternative if adequate ventilation and lighting is provided by artificial means.

Check that windows, glass partitions, and skylights are washed as often as necessary to keep them clean and that cracked or broken glass is replaced promptly.

## E. Category Assignments

To ensure uniform category assignments for deficiencies concerning room construction the following guidelines will apply.

### 1. Category A deficiencies:

- a. Peeling paint, rust, insulation fibers or other extraneous material noted on or in the product.
- b. A roof leak in a processing room that is contaminating product.
- c. Sewage backup into a processing, packaging, or product storage rooms.

### 2. Category B deficiencies:

- a. Peeling paint, loose rust, frayed pipe insulation, etc. directly above product or product contact surfaces but not observed on or in product.
- b. Peeling paint noted in a CIP tank.
- c. Paint chips or other extraneous material noted on cheese or butter, or on the conveyor to a grinder or microfix, provided that it is cleaned before further processing.
- d. Floating floors (if noted on the last survey and the condition has deteriorated).
- e. A roof leak in a processing or storage area (may be category A, depending on severity).

### 3. Category C deficiencies:

- a. Peeling paint, loose rust, frayed pipe insulation, etc. directly above product or product contact surfaces that have a cover, provided the cover is in place during the survey.
- b. Peeling paint, loose rust, frayed pipe insulation, etc. directly above uncovered CIP tanks.

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- c. A roof leak outside the processing or storage areas.
  - d. Most floating floors.
4. Category D deficiencies:
- a. Peeling paint, loose rust, frayed pipe insulation, etc. in a storage area, provided all gaskets and packaging supplies are covered.
  - b. Peeling paint, loose rust, frayed pipe insulation, etc. directly above CIP tanks that have a cover, provided the cover is in place during the survey.
  - c. Rough floors in a processing room.
  - d. Floating floor under CIP tanks, in a CIP room, or other nonprocessing areas of the plant

### **Item A2—Lighting & Ventilation (58.126d, e).**

#### **A. Lighting (58.126d).**

The General Specifications require at least 50 foot candles (F/C) of light intensity where dairy products are graded or examined for condition and quality, and 30 F/C at working surfaces in rooms for manufacturing, processing, or packaging dairy products or washing of equipment and utensils. In all other rooms, including storage rooms and coolers, light intensity shall be at least 5 F/C when measured at a distance of 30 inches from the floor.

Use a light meter to check light intensity. Judgement is needed in taking and reporting meter readings. Check that the lighting is ample and well distributed. The need is greatest where processing, packaging, cleaning, and inspection activities are taking place and these areas should receive primary attention.

50 F/C of light is needed in a can milk receiving room dumping area where milk is graded.

Encourage the provision of at least 30 F/C light intensity in rest rooms and locker rooms (a “should” item of §58.126d). When lighting is deficient, recommend improvement.

When contamination of product by broken glass is possible, light bulbs and fluorescent tubes shall be protected against breakage. Light fixture protectors help prevent accidental breakage of the relatively fragile bulbs and also prevent the spread of glass particles in the event of spontaneous breakage. Check for such protection for any light fixtures that are located so that bulb breakage could cause product contamination. With this approach it is conceivable that the fixtures on one side of a processing room might require protectors while those on the other side do not, and this would meet USDA requirements. In actual practice, however, many plants prefer to install protectors on all light fixtures in processing areas. This permits shifting of equipment and processes without special concern for adequacy of light protectors.

Incandescent bulbs may be satisfactorily protected with heat resistant plastic or other acceptable shields. Some incandescent bulbs are termed “unbreakable” because of plastic coatings or imbedded translucent fibers in the glass (“Tufskin” for example). Special protection against breakage is not necessary for such bulbs. However, be sure to check for adequacy of light level where they are used.

Fluorescent tubes are usually protected by transparent plastic enclosures on the bottom side of the light fixture. These shall be maintained clean and be free of debris. Alternately, round plastic tubes that slip over the individual fluorescent tubes can be used. Either type is satisfactory. If the latter type is used, make sure that the protective tube has end caps that hold the tubes in place in the event of breakage of the fluorescent tube. Another satisfactory protection method involves transparent resin or plastic coating of each tube to prevent escape of glass particles in case of breakage.

Mercury or sodium vapor type lighting fixtures are satisfactorily protected by their usual construction inside heavy glass reflective enclosures.

#### B. Ventilation (126d, e).

Adequate ventilation shall be provided to control room temperature, objectionable odors, humidity, and condensation. Inlet fans shall be provided with effective screens or filters to prevent the entrance of insects. Exhaust fans shall be screened or provided with self-closing louvers to prevent insect entrance. Persistent, strong odors in processing areas may indicate the lack of adequate ventilation, recommend that ventilation be improved.

Ventilation of toilet rooms shall be provided by mechanical means to the outer air (an exhaust fan). When there is no mechanical ventilation, recommend correction. (It is management option whether the exhaust fan is wired to operate from the room light switch, a thermostat, or a manual switch.)

Visible mold growth in areas where dairy products or packaging materials are exposed shall be considered a category A deficiency. This includes areas such as the butter churn room, butter cooler, cheese make room, starter room, cheese cooler, and cheese drying room (except as noted below). The presence of mold in areas remote from exposed finished product and packaging materials should be considered a category C deficiency. This may include areas such as separate receiving rooms, can wash rooms, engineering space, etc. If the mold is limited and immediately removed during the survey, plant status should not be affected (category E). However, the condition and correction shall be noted on the survey report and recommendations offered to prevent mold recurrence. If mold is noted in the same area on a subsequent survey, indicating the underlying problem has not been corrected, the deficiency should be assigned to category B or C. In plants producing cheese varieties where mold is a recognized attribute of the cheese, minor mold growth on surfaces other than the cheese, but limited to the cheese curing areas shall not affect status (see the guidelines for Item C58—Lighting & Ventilation). Mold in other processing areas shall be handled as required above.

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### C. Condensation (58.126d, e).

Examine the ceiling and walls for condensation or mold growth. The presence of moisture may indicate poor plant ventilation, inadequate heat, or inadequate insulation, and could lead to mold growth. Such conditions are unsatisfactory and condensation dripping into product or onto product contact surfaces is a serious deficiency.

Some cheese varieties may require high humidity conditions in the curing rooms that may lead to condensation in these rooms. If this is the case, do not criticize the condensation if the cheese is adequately protected from all moisture dripping from unsanitary surfaces.

### D. Category Assignments.

To promote uniformity in category assignments, use the following guidelines for lighting and ventilation deficiencies.

#### 1. Category A deficiency:

- a. Condensate dripping from unsanitary or unclean surfaces (such as the ceiling, cast iron pipes, service lines, pipe insulation, etc.) onto product, product contact surfaces, or into a brine tank.
- b. Mold in a processing area (unless cleaned during the survey).

#### 2. Category B deficiency:

- a. Condensate dripping from unsanitary or unclean surfaces (such as the ceiling, cast iron pipes, service lines, pipe insulation, etc.) onto product contact surfaces (provided it is cleaned and sanitized before any product is contaminated).

#### 3. Category C deficiency:

- a. Condensate dripping from clean clamps or other clean stainless steel fittings into product or onto product contact surfaces.
- b. Repeat deficiency; mold in the same area in a processing room (if cleaned during the survey).
- c. Less than 10 F/C of light in the area of a COP tank or where products are graded.

#### 4. Category D deficiency:

- a. Condensate dripping from clean stainless steel pipelines (but not fittings) into product or onto product contact surfaces.
- b. Low lighting on working surfaces.

5. The following items have an insignificant effect on the quality of the product, therefore, no recommendation is required.
  - a. Condensate dripping from the bottom of a clean, good condition stacked brine tank into the bottom tank (provided that the exterior of the top tank is constructed to the same specifications as the product contact surfaces of the tanks).
  - b. Condensate dripping from a clean surface (such as stainless steel pipes and fittings, a PVC water or brine pipe, drip shields, etc.) into a brine tank.

**Item A3—Pump, Pipelines, & Valves (58.128, 58.131d, 58.146a).**

**A. Weigh & Drop Tanks (58.128d).**

Inspect this equipment for condition and cleanliness. Dismantle sufficiently to allow a good evaluation. Check the dumping grid, baffle, screen, weigh tank valve, underside of covers, and the drop tank pump. Recommend correction when any product contact surfaces are found dirty or with broken or open seams. Splash grids shall be made of stainless steel or equally corrosion resistant material. Tinned iron grids (expanded metal) are unsatisfactory because of the difficulty in cleaning.

The weigh tank shall be provided with a cover. Drop tanks or receiving tanks shall be provided with covers if they are subject to splash, condensate, or drippage.

Check for adequate space and facilities for cleaning of the equipment, floor and any adjacent walls in the area. Where necessary to provide easy access, the drop tank shall be equipped with wheels or casters to allow easy removal.

**B. Pumps (58.128l).**

All centrifugal product pumps shall meet the requirements of the *3-A Sanitary Standards for Centrifugal and Positive Rotary pumps for Milk or Milk Products, Number 02-* (see Item A32—CIP System(s) for additional information concerning pumps used to circulate cleaning compounds).

Most pumps can be properly inspected for condition and cleanliness only by complete dismantling. The areas that need special checking for cleanliness are:

1. juncture and gasket between head and pump body,
2. fastening device for impeller(s), (especially if a threaded nut is used),
3. interface of shaft and impeller hole,
4. back plate and seal assembly.

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These are the most troublesome points on both positive and centrifugal type pumps. Proper cleaning of all these points usually requires daily dismantling and cleaning by hand brushing or by placing the dismantled parts in a COP tank.

Some newly designed centrifugal pumps (such as Fristam and APV) have been built to eliminate or successfully clean all the four previously mentioned "trouble spots." These pumps are similar to the older centrifugal pumps. One exception is that the impeller is bolted to the drive shaft with a cap nut (acorn nut). If these are encountered during the survey, have a representative number dismantled, if these are found to be satisfactory other similar pumps can be inspected by having the face plate removed to inspect it and the impeller for pitting and sanitation. It is not necessary to have all them dismantled further for inspection if the bolt and seal have been properly maintained.

When inspecting a conventional (non-CIP) pump that is not designed for easy dismantling of seal and back plate and the pump is not dismantled for hand cleaning, recommend replacement with a modern sanitary pump. Similarly, recommend replacement of any pump with permanent packing gland type seal. When the basic pump design is satisfactory, but daily dismantling is not performed due to rusted frame parts, damaged threads, lack of proper tools, etc., recommend necessary corrective maintenance or replacement to the pump.

So called "water seal" centrifugal pumps are often used for recirculating product in falling film evaporators, for removing final product from vacuumizers and evaporators, and for similar applications. Some of these pumps simply have provisions for exterior cooling of the shaft seal area with flowing water; some have enclosed water channels to direct the flow of cooling water around the exterior surfaces of the seals. While the primary purpose is to improve the effectiveness and life of the seal, the flowing water also performs a secondary function in washing away any product leakage from the back plate and seal area. The back plate and seal areas are usually quite difficult to take apart. Because of the water flushing of the seal areas, daily dismantling of these parts for hand brushing is not necessary if the other internal parts of the pump are constructed to permit satisfactory cleaning in place. However, if for instance, the impeller is fastened to a splined or keyed shaft with a threaded nut, there is no satisfactory alternative to daily dismantling as far as the back plate and seal for hand brushing of internal parts. Also, the water used shall be potable and should go to the drain. If this water is reclaimed for use in products assign the deficiency to category A unless the practice is discontinued.

Pumps made of "optional metal alloys" (sometimes referred to as "stainless metal," or "dairy metal") which are in good condition and otherwise constructed for sanitary use are satisfactory for general product pumping purposes. However, such metal alloy pumps may not be left in place in pipeline circuits which are cleaned in place, nor are they suitable for pumping the cleaning solutions at any point within a CIP pipeline cleaning system. Furthermore, metal alloy pumps are not satisfactory for the handling of hot dairy products because of the much greater rate of copper pickup from the metal. For such applications, recommend use of stainless steel pumps.

When definite pitting of pump parts is observed, whether made of stainless steel or metal alloy, recommend replacement with a pump meeting current 3-A Sanitary Standards (no recommendation is needed for slight pitted condition).

Pumps should be mounted in accordance with the 3-A Sanitary Standards. Use of bricks, wood, etc., to prop up pumps or other equipment should be criticized.

C. Pipelines & Fittings (58.128a, o).

Use a flashlight to check sufficient sections of pipelines to determine acceptable fabrication and cleanliness. Also, check pipeline fittings for construction, sanitation and condition of gaskets.

When conventional bevel seat pipelines are taken down and manually cleaned daily check that satisfactory facilities are provided. Minimum facilities would be a long wash tank (preferably long enough to hold the longest pipe section), either powered or manual type brushes in good condition and of proper length, adequate hot and cold water, and cleaning compounds. Such facilities should be conveniently placed. Where considerable distances are involved, duplicate facilities may be required at additional points in the plant.

Pipelines may be cleaned in place without disassembly when they are engineered and installed according to the *3-A Accepted Practices for Permanently Installed Sanitary Product Pipelines and Cleaning Systems, Number 605-*. Become familiar with these 3-A requirements and report any necessary recommendations about the CIP system under Item A32–CIP System(s). Use this item to cover any deficiencies with the condition or sanitation of the pipelines.

Pasteurized product pipelines shall be properly separated from raw product and CIP pipelines according to the following guidelines.

1. There shall be a physical break between pasteurized products pipelines and raw products pipelines.
2. There shall be complete separation between the product pipelines or tanks and the CIP pipelines that contain cleaners or sanitizers.
3. Pasteurized dairy products and pasteurized nondairy products may be separated by a single valve.

Block-and-bleed systems can be used to provide complete separation between product lines (or tanks) and CIP lines (or tanks).

The requirements of block-and-bleed systems used to separate product lines and tanks from CIP lines is valve seat–opening to the atmosphere–valve seat (block-bleed-block). Sometimes the arrangement is valve seat–valve seat–opening to atmosphere (block-block-bleed), which is not acceptable.

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Deficiencies in this area may be found in the piping of some cheese vat installations. Although there are many block-and-bleed arrangements, a vent is usually required between each vat. Carefully follow the lines to determine the location of the block-and-bleed valves. Note that sometimes the valves and the vent are spaced quite a distance apart. Also, carefully check the CIP lines. On some vats the CIP lines contain two valves, but not the required opening to atmosphere between them. If you have any questions about a particular arrangement, call the National Field Office.

When deficiencies are noted, recommend a proper block-and-bleed system or physically disconnecting the lines. Deficiencies concerning the block-and-bleed system should be assigned to category C.

Some double seat valves (also called mix-proof valves) can be used for this purpose. These valves contain two valve seats, which operate independently, with an opening to the atmosphere between them (block-bleed-block within one valve body). These are not flow diversion valves (where both seats are attached to the same stem and move together). Some requirements for mix-proof valves to be acceptable are: a full line size opening to the atmosphere between the valve seats (some have a smaller opening, which is not acceptable); both valve seats must be position detectable; and no manual overrides in the system.

If you encounter these valves during a survey, ask to have one dismantled and check the valve seats for cleanup (a separate CIP cycle, after the tanks and lines are washed, is required to clean the valve seats).

Block and bleed systems cannot be used to separate raw products (dairy, non-dairy or water) from pasteurized milk or milk products. Also, block and bleed systems cannot be used to separate product lines (raw or pasteurized) from lines carrying concentrated chemicals used to make-up CIP and sanitizer solutions. In these circumstances a complete physical break is required.

Inspect the sanitary piping systems carefully for dead ends, which are unsatisfactory because they; 1) trap products during the processing run, 2) present a cleaning problem, 3) allow product warmup (or cooling) in "dead " area to permit bacteria growth in the trapped product, and 4) allow collection of cleaning compounds that may adulterate the product. Recommend elimination of such dead end conditions. Also recommend use of elbows for making tubing direction turns rather than capped tees. Proper choice of valve types, location of valves, and insulation are also important to avoid dead end conditions. This does not preclude the use of short couplings to valves or the short pockets formed by hookups using standard "3-A" dairy fittings. Such short pockets are probably not significant if fluid turbulence is sufficient to mix and move the product continuously. Dead ends shall not exceed two times the pipe diameter or five inches, whichever is shorter.

Bypass piping should also be carefully evaluated. There is nothing wrong with bypass piping provided there is some continuous flow through it during processing operations. If valved off completely, however, such piping will form a serious dead end condition. Also check bypass piping carefully for sanitation as it is often neglected.

Standpipes are sometimes installed in sanitary pipelines to absorb shocks caused by rapid surges in fluid product pressure. Air trapped in the standpipes acts as a cushion by being compressed to a smaller volume. However, the fluid product also rises at least part way up the stand-pipe and may be trapped in a dead end condition for long periods, causing serious bacteria contamination problems. Of course the problem is minimized if the product temperature is either cold or very hot. If possible, standpipes should be eliminated. If the pressure surges cannot be remedied, and a fluid damper effect is essential, be sure to check for proper cleaning of standpipes. Daily dismantling and hand brushing is usually required.

In general, product piping within the plant shall be rigid type stainless steel or glass. Flexible hose meeting 3-A requirements (such as tygon) may have a few satisfactory in plant applications, for instance to isolate equipment vibration, to make special angled connections, temporary hookups, etc. However, such uses should be limited. When unnecessary flexible hose applications are noted, recommend replacement with stainless steel piping.

When clamps are used to connect flexible hose to pipe stubs, the clamps should permit easy dismantling for daily cleaning of hose and stubs. Screwdriver-type clamps would constitute minimum compliance in this regard, although adjustable toggle type clamps are preferable. If product buildup is noted between the hose and the stub end recommend providing hose assemblies that meet the *3-A Sanitary Standards for Hose Assemblies for Milk and Milk Products, Number 62- .*

The use of insulation on milk and milk product pipelines is acceptable provided the following requirements are met:

1. The insulation shall not be installed over any gasketed elbows, tees, or other pipeline or instrument fittings. Also, it shall not be installed over any pipeline valves, whether or not the valve is gasketed or is welded in place.
2. About 6 inches of uninsulated space shall be provided on each side of a valve or gasketed pipeline fitting.
3. The cut edges of the insulation shall be covered and sealed to the pipe so that the insulation is protected from water, product, or cleaning solutions.
4. The cover material shall be smooth and cleanable. All cover joints or seams shall be sealed.
5. Insulation shall be restricted to product pipelines that are cleaned in place.

D. Valves & Special Fittings (58.128a, o).

Dismantle sufficient valves and special fittings (thermometer wells, tees, check valves, pressure sensors, etc.) to check condition and sanitation.

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Policy toward valves and fittings made of “optional metal alloys” is the same as outlined above for pumps made of such materials.

Replacement valves and fittings shall comply with applicable 3-A Sanitary Standards.

The trend to automate the cleaning of equipment and reduce the amount of hand cleaning has been occurring in the dairy industry for many years. Plant management has learned the advantages of CIP cleaning and elects automation to an increasingly greater degree. When CIP systems are installed, the amount of hand cleaning necessary to clean valves, pumps, and appurtenances is generally kept to a minimum. During our routine plant inspections, we have noted many plants that have incorporated valves that require daily disassembly and hand cleaning. All hand operated valves and all ball valves (both hand operated and automatically actuated) must be dismantled and hand cleaned. When these valves are found dirty during our routine plant inspection, make the recommendation to dismantle daily and hand clean the appropriate valve and, if appropriate, recommend to the National Field Office a reduction in plant status.

Plug valves shall meet the requirements of the *3-A Sanitary Standards for Plug Type Valves for Milk and Milk Products, Number 51-* . When cores for plug type valves are made of plastic or rubber-covered metal, check for deterioration, sloughing, bubbles, etc. in the coating and recommend replacement or recoating when applicable.

Compression valves shall meet the requirements of the *3-A Sanitary Standards for Compression-Type Valves for Milk and Milk Products, Number 53-* . Check that the stems of compression type valves are fastened with proper, easily removable “R” clips (no cotter pins, wire, bent nails, etc.).

Ball valves shall meet the requirements of the *3-A Sanitary Standards for Ball Valves for Milk and Milk Products, Number 68-* , (note that the 3-A Accepted Practice for Spray Dryers has an exemption to this requirement in high pressure applications). All ball valves, whether manually or automatically actuated, require daily dismantling and hand cleaning.

Butterfly type valves, commonly used on farm bulk tanks, are not satisfactory for plant use except in some dry product applications. Proper cleaning of these valves when used in fluid applications requires daily dismantling and hand brushing. If you encounter butterfly valves during a survey ask to have them dismantled. If they are found unclean recommend replacement with a valve that meets the 3-A Sanitary Standards.

In May 1997 the 3-A Sanitary Standard for shutter-type valves was rescinded and no further action is expected on this standard. Therefore, the Koltek Shutter style valve does not meet the 3-A Sanitary Standards. Any valves installed in plants prior to May 1997 are grandfathered. If this type of valve is noted in the plant, request that it be dismantled and inspect the interior areas. If unsanitary conditions are observed recommend daily dismantling and hand cleaning or replacement with a valve that meets the 3-A Sanitary Standards.

Special air operated valves designed for CIP cleaning should be dismantled and checked in sufficient numbers to determine adequacy of cleaning. For proper cleaning, such valves should be actuated to move up and down during the recirculation cleaning regimen for cleaning of the stem and O-ring(s).

E. Prefilters (58.128o).

Product filters that utilize a single service filtering media (i.e., cloth socks) shall comply with the *3-A Sanitary Standards for Milk and Milk Product Filters Using Disposable Filter Media, Number 10-*. The filtering media shall be removed prior to CIP and shall be disposed of after each use. It is unsatisfactory to wash and reuse the filters, if this is observed recommend daily disposal. This shall be considered a category D deficiency unless the recommendation is on a previous survey. Then it shall be considered a category C deficiency.

Product strainers shall comply with the *3-A Sanitary Standards for In-Line Strainers for Milk and Milk Products, Number 42-*. Dismantle and check the strainer for sanitation and condition. If pitted product contact surfaces, improper radii in O-ring grooves, etc. are present, this item is unsatisfactory. In addition, if debris is noted, recommend removing the strainer prior to CIP for hand cleaning. If wedge wire is used, recommend removal for cleaning in a COP tank. The tank should be designed to prevent damage to the wedge wire strainer during cleaning.

Note:

Woven wire screens do not comply with these standards.

F. Compliance with 3-A Sanitary Standards (58.128o).

This policy shall apply to all equipment in the plant except for previously identified grandfathered equipment. Report the deficiency under the appropriate item number (i.e., a new mixer/molder should be reported under Item C28–Mixing & Molding Equipment). Do not try to specify how to correct deficiencies related to the equipment design or engineering. Plant management or the equipment manufacturer should initiate any modifications for sanitary reasons.

Equipment accepted or approved by the USDA, Food Safety and Inspection Service (FSIS) or a State Inspection Agency does not confer acceptance by the Dairy Grading Branch.

1. Inspection of equipment not covered by a 3-A Sanitary Standard.

For equipment that is on the *Accepted Equipment List* follow the guidelines for section 3 below.

For equipment not listed, use the *USDA Equipment Guidelines* as the reference. If fabrication deficiencies are noted make a recommendation such as “Provide documentation that {name of equipment} meets the USDA, Dairy Division guidelines” and assign the deficiency to category D. Also, fill out a Nonconforming Equipment Report, with a list of the noted deficiencies (both sanitation and fabrication) if any, and attach it to the survey report. All deficiencies shall also be listed on the survey report with an appropriate category assigned to them.

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2. Inspection of equipment covered by a 3-A Sanitary Standard but the 3-A Symbol is not displayed.

Use the appropriate 3-A Sanitary Standard as the reference when inspecting the equipment, whether the 3-A symbol is displayed on that particular piece of equipment or not. However, do not criticize equipment for not displaying the 3-A symbol. The inspection should not include recommending that the equipment manufacturer apply for and obtain the 3-A symbol, since use of the 3-A symbol is optional. Equipment fabricators are not required to obtain 3-A certification from the 3-A Symbol Council for equipment installed for use in USDA approved dairy plants. Nonetheless, all equipment covered by 3-A Sanitary Standard and installed in an approved facility is required to comply with the 3-A Sanitary Standard regardless of whether the 3-A symbol is displayed.

Equipment that does not display the 3-A symbol should be inspected for sanitation problems and for workmanship, material, and design deficiencies that may deviate from the 3-A Sanitary Standards. If fabrication deficiencies are observed, make a recommendation such as “Provide documentation that {name of equipment} meets the 3-A Sanitary Standards” and assign the deficiency to category D. In addition, fill out a Nonconforming Equipment Report Including a list of the noted deficiencies (both sanitation and fabrication) if any, and attach it to the survey report. All deficiencies shall also be listed on the survey report with an appropriate category assigned to them.

3. Inspection of equipment displaying the 3-A symbol or on the *Accepted Equipment List*.

Pieces of equipment that do display the 3-A symbol or are on the *Accepted Equipment List* should be assumed as acceptable for use in USDA approved plants. A certificate from the 3-A Symbol Council is not equivalent to having the symbol displayed (see the guidelines for section 2, above). The inspection of equipment bearing the 3-A Symbol should focus on sanitation deficiencies.

However, if the routine inspection reveals deficiencies with materials, design, fabrication, or workmanship, that appear to violate the applicable 3-A Sanitary Standards or the *USDA Equipment Guidelines* make a recommendation such as “Provide documentation that {name of equipment} meets the 3-A Sanitary Standards or USDA, Dairy Division equipment guidelines” and assign the deficiency to category D. Also, fill out a Nonconforming Equipment Report with a list of the “3-A” violations noted and attach it to the survey report. Clearly show on the form that the equipment displays the 3-A Symbol or is on the USDA list. All deficiencies shall also be listed on the report with an appropriate category assigned to them.

4. Grandfathered Equipment.

Some equipment in the plant may have a “grandfather” exemption (see Section I, Item O). If you have any questions concerning what equipment is grandfathered, check with the National Field Office. Any new or replacement equipment (including most equipment that has a grandfather exemption in a different plant and is then moved to this plant) shall meet the applicable 3-A Sanitary Standard or the requirements in the USDA Equipment Guidelines.

**Item A4—Can Washer (58.128c, 58.146b).**

Check the can washer for acceptable construction and delivery of clean, dry cans and covers. When an excessive scale buildup is noted, recommend that the washer be treated to remove scale. Inspect the jet openings used to clean cans and covers, these are unsatisfactory if the holes are plugged. Check other items, such as the condition of screens in wash and rinse tanks, draining and cleaning of these tanks at the end of the run, proper operation of temperature controls, effective operation and pressure of jets, and the regular changing of the filter on the air dryer. Also check for tight-fitting jacket and doors and an adequate exhaust fan to remove vapors from the washer (failure to exhaust the humid air from the washer could contribute to condensation and mold problems in the receiving room). The results of the can inspection will be a helpful indicator of the washer performance.

The steam pressure to the can washer should be not less than 80 pounds and the temperature of wash solution and final hot water rinse should be automatically controlled. The wash solution temperature should be as recommended by the manufacturers of the washer and the cleaning compound, usually 130-140°F. The final hot water rinse should be 190°F or higher to promote rapid drying of the cans.

Some plants have can washers with stainless steel extensions and drip pans at the can carriage, and the can drippings are collected and added to the plant milk supply. This is not a satisfactory practice because much of this milk has been found to be of reject quality (such milk is exposed in the catch trays to room air contaminants, and drippage from the exterior of wet cans). There is also considerable warming of the milk during the collection process. When the plant is using can drippings in products, assign the deficiency to category B and recommend that the plant discontinue this practice. The drippings shall be used for animal feed or disposed of in a satisfactory manner.

When disposed of as animal feed, cans for handling the drippings should be kept clean to prevent odor or insect problems. Make recommendation for correction when dirty cans are noted. Do not criticize use of rusty cans for this purpose provided they are distinctively marked as animal feed and are used only for handling drippings.

**Item A5—Condition of Producer Cans (58.131a, 58.146b).**

When milk is received in cans, inspect a sufficient number (approximately 50%) to represent the supply of producer cans received at the plant. Usually this can be most easily accomplished by inspecting cans directly from the can washer. Be sure you have sufficient lighting in the inspection area to check the cans properly; either direct sunlight, strong flashlight, drop cord, or high intensity plant lighting. Consider the can and its cover as a unit and inspect both components. The condition of the cover must be considered in determining the classification of the unit.

When a unit has more than one defect, classify it according to the most serious defect. Use the following terminology:

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Good	Clean, well tinned (satisfactory).
Slight Rust	Few rust spots. Still satisfactory for use, but will require retinning soon (satisfactory).
Definitely Rusty	Excessive rust. Should be retinned or replaced (unsatisfactory).
Open Seam	Parted seams or cracks. Usually noted at bottom or shoulder of soldered multiple-piece cans (unsatisfactory).
Dirty	Interior not clean, includes milkstone which is a form of dirty can condition (unsatisfactory).

When inspection of milk cans reveals less than 10% in unsatisfactory condition (definite rusty, open seam and dirty), check this item as satisfactory and show the number of cans inspected and the percent unsatisfactory.

Example:

A5. — 92 (6% unsatisfactory)

If more than 10% of the cans are unsatisfactory, assign this deficiency to a category based on the following chart. Also, record the number of cans inspected, the reason (definite rusty, open seam and dirty), and the percent unsatisfactory.

CATEGORY E	1 - 10%
CATEGORY D	11 - 15%
CATEGORY C	16 - 30%
CATEGORY B*	31 - 39%
CATEGORY A	40% or over

- \* Although in other cases one category B deficiency would make raw receiving and, therefore, the plant INELIGIBLE, in the case of unsatisfactory cans list the deficiency as category B on the survey report and assign status of not higher than APPROVED-3 MONTHS to the M1 code.

Example:

- A5. — Reduce off-condition cans below 10%. 130 examined (35% unsatisfactory: 20% definite rusty, 9% open seam, and 6% dirty) (B).

When most of the plant's milk is received in bulk (greater than 50% by volume) special consideration should be given when assigning the deficiency to a category. In such instances, the category assignments based on the above percentages of unsatisfactory cans need not apply but the report should stress the need for improvement of the cans.

Example (assuming 20% can milk):

- A5. — Reduce off-condition cans below 10%. 130 examined (35% unsatisfactory: 20% definite rusty, 9% open seam, and 6% dirty) (C).

When the plant receives both bulk and can milk, show on the report the approximate percentage of the total milk supply being received in cans. Show the information in the main heading section in the left margin.

Example:

RECEIVING  
CANS  
20%

When can replacements are needed, recommend that seamless cans with umbrella type lids be provided (this can be handled verbally with management).

**Item A6—Milk Route Trucks (58.131c).**

Inspect a few route trucks for enclosed bodies, good repair, and for cleanliness. Check for decking boards or racks if more than one tier of cans is carried.

Cans or bulk truck tanks used for the transportation of raw milk from the farm to the plant shall not be used for transporting skim milk, buttermilk, or whey to producers. This does not preclude enclosed tanks with outside-located inlets and outlets to be installed in can route trucks for returning these products to producers, when such practice is permitted by applicable State Regulations.

When unsatisfactory truck conditions are noted, recommend correction.

Sometimes local producers deliver milk or cream direct to the plant in open conveyances instead of using route trucks. When this is noted, recommend use of enclosed vehicles.

**Item A7—Housekeeping (58.126e, 58.127f, 58.146d).**

Check for good housekeeping, which essentially consists of storing needed items in an orderly manner in their proper place and in excluding unnecessary items.

Although good housekeeping is not directly related to product quality, it is nevertheless an indication of an operation that is under good management control. Minor housekeeping deficiencies may be covered verbally with management, however, if housekeeping is generally poor show a recommendation for improvement on the report.

Containers used for the collection and holding of wastes shall be constructed of metal, plastic, or other equally impervious material and kept covered with tight fitting lids. Waste shall be stored in an area or room in a manner to exclude flies and vermin. Accumulation of dry waste paper and cardboard shall be kept to a minimum and disposed of in a manner that is environmentally acceptable.

Throwaway plastic or multi wall bags may be used as waste receptacles in the plant, provided they are used with a bag holder device equipped with a satisfactory cover.

## Receiving—Bulk

### Milk Transfer Stations

To provide inspection guidance and clarification of Dairy Grading Branch responsibilities for the inspection of milk transfer or pump over stations, the following is a breakdown of the various types of milk transfer or pump over facilities you may encounter.

A. Stations Receiving 100% Grade A Milk.

Receiving stations that are routinely inspected by the State and are listed in the current copy of the IMS List do not require Dairy Grading Branch inspection or review of patron records. They would not be listed in the *Approved Plant Book* (USDA will provide service and listing in the book at the request of the receiving station).

B. Stations Receiving Both Grade A and Grade B Milk.

These transfer stations generally have two intakes or designated equipment, one for each grade of milk. The intake equipment shall be inspected and the patron records reviewed by Dairy Grading Branch. The facility would be listed in the *Approved Plant Book*.

C. Truck to Truck With No Other Equipment Involved.

This type of activity may occur within a building or on the side of the road somewhere in the countryside. Monitoring and regulating this type of activity is the responsibility of the State Regulatory Authority. Dairy Grading Branch does not have any involvement in these situations. Those situations conducted within a building shall not be inspected nor listed in our *Approved Plant Book*.

D. Truck to Truck Within a Building Using Additional Equipment.

The additional equipment used is the important factor in these situations. This equipment may include pumps, pipelines, valves, cleaning systems, etc. These facilities shall require Dairy Grading Branch inspection and review of patron records. The facilities with eligible status assignments would be listed in the *Approved Plant Book*.

E. Truck to Storage Tank to Truck.

This is a traditional milk receiving station. These facilities shall require Dairy Grading Branch inspection and review of patron records. The facilities with eligible status assignments would be listed in the *Approved Plant Book*.

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If you are surveying a receiving station, or transfer station, the applicable inspection requirements are outlined in §58.131b. Read these sections carefully, as well as the following guidelines:

1. A receiving station is defined in §58.101y as “any place, premise, or establishment where milk or dairy products are received, collected or handled for transfer to a processing or manufacturing plant.” Refer to §58.125 through §58.130 for applicable requirements for premises, buildings, facilities, equipment, utensils, and personnel cleanliness and health. Requirements are the same as for processing plants.
2. A transfer station is defined in §58.101z as “any place, premise or establishment where milk or dairy products are transferred directly from one transport tank to another.”
3. Premises, as outlined in §58.125.
4. Building, as outlined in §58.126. Enclosed facilities are required except where mild climatic conditions prevail.
5. Floors, as outlined in §58.126c. A concrete slab with a drain and a water hose would constitute minimum compliance for an out-of-doors transfer operation.
6. Lighting, as outlined in §58.126d. Natural outdoor lighting satisfies the requirement if all the milk transfer operations are conducted during the daytime. For night time operations, artificial lighting of 30 F/C is required in the working area. When the transfer operation is conducted indoors, check for 30 F/C artificial lighting.
7. Water supply, as outlined in §58.127a. A supply of potable water is required to hose down milk spillage in tanker pump compartments and to keep floor or slab clean.
8. Hand washing facilities, as outlined in §58.127c, except that hot water is not required at transfer stations that are conducted out-of-doors. At such stations, minimum hand washing facilities would consist of soap and paper towels with the aforementioned potable water supply.
9. Disposal of wastes, as outlined in §58.127f. Drainage from the floor or slab drain shall be properly disposed of either into a sanitary sewer or “where a public sewer is not available, all wastes shall be disposed of so as not to contaminate milk equipment or to create a nuisance or public health hazard.” This wording would permit surface drainage from the site within the limitations specified.
10. General construction, repair and installation of equipment, piping, and utensils, as outlined in §58.128a. Review this section for applicable requirements. (When tanker hoses are used to transfer the milk, there are no applicable requirements for equipment, piping, and utensils.)

11. Personnel, cleanliness and health, as outlined in §58.129 and §58.130. Review these sections for requirements, which are the same as for personnel who work in a processing plant.

The above are minimum requirements for all regularly used transfer stations. Exceptions to these requirements may be made for transfer of milk from one tanker to another for reasons of truck breakdowns, temporary weight restrictions on roads, short-term use while a satisfactory facility is being constructed, etc.

**Item A10—Room Construction (58.126, 58.131b, c, 58.146c, d).**

See the guidelines for Item A1—Room Construction.

Enclosed facilities are required except where mild climatic conditions prevail, in which case covered facilities are satisfactory. Mild climatic conditions shall be defined as the absence of snow or freezing temperatures during the winter months. APPROVED-6 MONTHS is the highest status that can be assigned when a plant that receives farm bulk milk does not have satisfactory enclosed or covered facilities available for cleaning the truck tanks, piping, and accessories. Contact the National Field Director if in doubt which requirement applies for a particular location.

In instances where the plant merely loads or unloads milk or milk products (no washing of the tank), a concrete slab with a drain and a water hose are the minimum facilities required, provided that the products can be transferred under sanitary conditions. (For example, when a top vent filter is in place during unloading or when closed system piping is employed for load-out.) If the tank is washed at another location, show on report the name and address of the plant or location where the tank is washed and sanitized

Bulk milk receiving rooms shall be separated from the processing rooms by a solid wall. Inspect for complete segregation of bulk milk truck unloading operations from any adjacent processing room. If the required segregating wall has a doorway for personnel, such doorways shall have a self-closing solid door.

Note:

The solid door should ordinarily be kept closed, although there is no objection to keeping it open for plant ventilation through a screen door during periods when bulk milk receiving operations are not underway.

Inspect the ceiling, walls and floors for construction, condition, and cleanliness. Check the floor drain(s) for proper trapping. Sand pit collection sumps are often provided prior to the drain traps. This is satisfactory practice because the drains and traps would otherwise be quickly plugged up from the dirt and sand brought in on the truck wheels. Preferably, the sump and its outlet to the drain should provide for self-skimming of the water surface in the sump to remove butterfat, foam, or other floating debris. Remodeling of existing drains for self-skimming is not required but guidance to this effect should be provided for new installations or major remodeling.

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Lighting in the bulk receiving facility should be at least 30 F/C intensity at the room areas where unloading pumps and hookups are made and where the tankers and equipment are washed. Lighting in the rest of the room must be at least 5 F/C. When the tanker interior is cleaned by hand-wash methods, a supplementary light source may be needed to provide adequate illumination inside the tank. A voltage reduced, protected bulb with retractable cord is a good, safe way for management to provide lighting for this job.

### **Item A11—Lighting & Ventilation (58.126d, e).**

See the guidelines for Item A2—Lighting & Ventilation.

### **Item A12—Pumps, Pipelines, & Valves (58.128, 58.131d, 58.146a).**

See the guidelines for Item A3—Pump, Pipelines, & Valves.

Use this item to report condition of the plant pumps, pipelines, and fittings employed for unloading tankers.

The unloading lines shall be capped when not in use.

Use of tygon or similar plastic hose material meeting *3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-* is satisfactory. Where hose collapse is a problem, special tygon hose is available which is specially protected against collapse by integral spiral windings of more rigid PVC material.

Using rubber tubing when the material complies with *3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-* is also satisfactory. Wire reinforced rubber hose is acceptable if the rubber material meets the above 3-A requirements and is in good sanitary condition without any apparent breaks or crimps on the side walls of the hose. Check the interior carefully with the flashlight.

Checking for compliance of hose material with the 3-A requirements is not necessary. However, in instances where the material is questionable, ask management to supply a letter or other evidence from the hose manufacturer verifying 3-A compliance.

Be sure to dismantle any sampling, air eliminator, or milk metering devices and check for proper daily cleaning. Make applicable recommendations about sanitation and condition deficiencies.

### **Item A13—Truck Tanks, Pumps, & Fittings (58.131c, 58.146c).**

Condition of pump, pipes, hoses and fittings in the back compartment of farm bulk trucks should be reported under this item following the inspection guidance outlined in guidelines for Item A3—Pumps, Pipelines, & Valves.

Farm bulk trucks shall meet the requirements of the *3-A Sanitary Standards for Stainless Steel Automotive Milk and Milk Products Transportation Tanks for Bulk Delivery and/or Farm Pick-Up Service*. Try to inspect at least one cleaned bulk tank truck during a survey of small plants and two or three at large plants.

The pump and hose cabinet and manhole dust cover shall be tight fitting and gasketed to prevent entrance of road dust. Outlet valves shall also be suitably protected by location in a gasketed compartment or by provision of a tight fitting dust cover.

When either the plant or farm truck unloading hose is cleaned by recirculation procedures, there is no maximum hose length. However, when either manual or power brush washing is employed, hose lengths should be restricted to that which may be accommodated by the brush length. (Hose reversal permitted.)

Occasionally milk may be held overnight in the farm bulk tank before unloading into plant. This is satisfactory procedure if the truck mounted pump, fittings and hose are cleaned before overnight storage. In the morning, the clean pump and hoses may be used to unload the milk. After washing of the tank, the truck is ready for farm pickup of milk without rewashing the just-used back compartment equipment. This corresponds to usual practice when a number of loads are picked up from the farm on the same day. Washing between loads is not necessary when empty time is short.

Inspect the interior of the tank with a flashlight and if necessary, enter tank for close examination. All semi-type tankers should be entered for inspection because it is not possible to inspect all surfaces from the manhole (before entering any confined space follow the guidelines in Section I. Item N). The inspection should include careful checks for cleanliness and for cracks, especially around piping connections, the outlet, and any previously repaired areas. Also, check the exterior jacket of the tank. It should be clean and free from open seams or cracks that would permit liquid to enter the insulated jacket.

Tank manholes should be provided with an adequate filtering device during loading and unloading. Although this is a "should" item, criticize lack of air filtration at the manhole.

§58.146c outlines a tagging system for cleaned and sanitized tankers that may be helpful at certain plants to monitor the performance of plant employees and equipment with respect to tank cleaning (a "should" item).

#### **Item A14—Cleaning Facilities (58.131c, 58.146).**

This item covers the facilities provided in the bulk milk receiving or washing room for cleaning bulk truck tanks and their accessories.

When tanks are washed by CIP methods, the system should have a recording thermometer in the return line and automatic temperature controls. The recording chart should show the date, tanker identification, and be initialed by the employee operating the system. Good slope for solution drainage from the tanker is important for successful mechanical cleaning. Such slope

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is usually provided by the designed pitch of the floor in the tanker washing area. Separate solution and rinse tanks are desirable for making up cleaner and rinse solutions, adjusting solution temperature, and keeping a low solution level in the tanker during recirculation. However, if tankers are being satisfactorily cleaned without such tanks, check the item satisfactory. If cleaning performance is inadequate, look at the CIP charts, spray balls, pumps, valves, and monitoring system for deficiencies and recommend needed corrections.

When the truck tanks are washed manually, check that the buckets and cleaning tools that are used will not scratch the tank and that a safe light source is available to aid in the cleaning.

Satisfactory facilities, usually a double compartment sink, should be provided for cleaning the tanker outlet valve, pump, fittings and hoses. The parts may be cleaned in a wash tank in or near the bulk room. Hand brushing in a bucket of cleaning solution at the truck pump compartment is also a satisfactory practice. As another alternate method, these parts may be cleaned by recirculation turbulence principles in a COP tank equipped for this purpose. Washing or rinsing of parts on the floor is unsatisfactory.

§58.146a of the General Specifications states that steel wool or metal sponges shall not be used in the cleaning of any dairy equipment or utensils. If this practice is noted during the survey, make an appropriate recommendation.

Suitable detergents, dairy cleaners, sanitizers, and wetting agents or other similar materials may be used to facilitate cleaning. To avoid unnecessary duplication of effort, Dairy Grading Branch plant surveys will not cover checking for plant compliance with FDA and EPA requirements.

### **Item A15—Housekeeping (58.126e, 58.127f, 58.146d).**

See the guidelines for Item A7—Housekeeping.

## **Quality Program**

### **Item A18—Sight - Smell Grading (58.133a, 58.136).**

Observe the receiving of milk to determine if each can is examined routinely for appearance and odor. Smelling the underside of the can covers shall not be considered as adequate milk grading procedure. Check several cans of milk to verify that adequate grading is performed and that reject quality milk is actually rejected. When grading is deficient, recommend that line grading be improved to assure that only acceptable quality milk is received in the plant.

Determine if it is regular practice to make sight-smell checks of each tanker-load of bulk milk before unloading. This provides a check on the grading of the milk at the farm before pumping into the bulk truck and allows segregation in case of serious quality defects. Preferably, the sight-smell grading should be performed by a plant employee, but there should be no objection if the manager delegates the responsibility to bulk route drivers. It is also important that sight-smell tests (as a minimum) be performed before unloading each tanker of milk received from other plants, receiving stations, or transfer stations. If it is not routine plant practice to make sight-smell checks before unloading bulk milk, discuss this with the plant manager and recommend on the report that such checks be made.

### **Item A19—Raw Products Testing (58.132, through 58.141).**

The Grade A quality program is considered an alternate acceptable program as provided in §58.141 of the General Specifications. Therefore, when the plant has no producers of its own (i.e., the entire milk supply is purchased) and is under jurisdiction of a Grade A authority and meets their requirements, or when the plant supplements its own milk supply with purchased tanker loads of milk under the jurisdiction of a Grade A authority, the supplemental milk is considered acceptable as provided in §58.141 of the General Specifications. When this occurs, reviewing quality test results is not necessary. Milk from the plant's own producers, regardless of the grade, must comply with the USDA milk quality program as outlined in this section.

Where developed acidity in milk is a problem, laboratory equipment for running acidity tests should be provided at the intake in a handy location for use by the milk grader on borderline quality milk. The company should establish a definite acidity reject level.

#### **A. Abnormal Milk Program (Mastitis Control) (58.133b).**

The General Specifications require each patron's milk to be tested at least four times in each six month period at irregular intervals. When two of the last four consecutive somatic cell counts exceed 750,000 cells per milliliter (ml) the appropriate State regulatory authority shall be notified and a written notice given to the producer.

In addition, another milk sample shall be tested within a period of 3 to 21 days. If the result is more than 750,000 cells/ml, the patron's milk shall be rejected until corrections are made and the somatic cell count is reduced to 750,000 cells/ml or less.

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During the plant survey, determine if these functions are being routinely performed. When the review finds that tests are not performed at least four times in each six month period, assign the deficiency to category D. When the review finds that there are producers with somatic cell counts above 750,000 cells/ml without the proper follow-up, assign the deficiency to category C.

When the plant has no abnormal milk program or has a program that has major deficiencies, this deficiency should be assigned to category C.

If the next survey reveals the plant still has no abnormal milk program or there remain major deficiencies in the program this deficiency shall be assigned to category B.

### B. Drug Residue Testing (58.133c).

All milk received shall be tested, prior to processing, for beta lactam drug residues. A sample shall be taken from each tanker load prior to further commingling. For can milk, a composite sample shall be formed at the plant, using a sampling procedure that includes milk from every can on the vehicle. In addition, individual producer samples shall be obtained from each milk shipment. These samples do not have to be tested unless the load sample is positive for antibiotics. (See 7CFR 58.133c for more information.)

The plant shall notify the State Regulatory Agency of any positive sample and all milk from the producer responsible shall be rejected until milk from a subsequent milking does not test positive. When the review finds the tests are not performed on each tanker, or lack of proper follow-up, assign the deficiency to category A.

### C. Sediment Testing Requirements (58.134).

Sediment tests are important if a plant is to have a meaningful quality control program. The General Specifications require that the tests be performed on samples of all milk received from individual producers (both Grade A and Grade B producers) at least once per month at irregular intervals. In addition, follow-up testing is required on No. 3 and 4 results. Determine if the plant is performing these necessary tests. Also determine if required retests are made. Follow-up testing of a producer's milk may be discontinued when a No. 1 or 2 result is obtained. Test procedures shall be those outlined in the latest edition of *Standard Methods for the Examination of Dairy Products*.

#### 1. Can Milk.

One or more cans of milk selected at random from each producer using the off-the-bottom method. This method uses a one pint sample filtered through a 1½ inch diameter disc.

#### 2. Bulk Milk.

The General Specifications refers to the mixed sample method for bulk milk using a one pint mixed milk sample through a 0.4 inch diameter disc. The latest edition of *Standard Methods* references an additional method using so-called "universal samples" of either 1, 2, or 4 ounce

sample sizes and employing discs with respective diameters of 0.1, 0.14, or 0.2 inches. This test method is already in use and should not be criticized.

If the plant has no photographic standard on hand to aid in classifying discs, recommend that a standard be obtained. The following sediment and other standards are available:

Standard Number	Cost	Description
7 CFR 58.2729	\$5.00	Three photographs for classifying 1½ inch discs by off-the-bottom method (can milk).
7 CFR 58.2731	\$5.00	Three photographs for classifying .4 inch discs for mixed sample method (bulk milk).
7 CFR 58.2732	\$5.00	Photographs to show 0, .5, 1.5, and 2.5 mg. sediment discs for use with 1, 2, or 4 ounce samples on .1, .14, or .20 inch diameter discs (universal samples, bulk milk).
7 CFR 58.2676	\$5.00	Photographs for classifying scorched particles
NA	\$20.00	Butter Color Chips

Send a check or money order (payable to Agricultural Marketing Service) to:

USDA/AMS/Dairy Programs  
Dairy Standardization Branch  
Room 2746-South Building  
1400 Independence Ave., SW  
Washington, D.C. 20250-0230

Phone (202) 720-7473  
Fax (202) 720-2643

When a plant is not making the monthly tests or retests as required, make a recommendation that illustrates the deficiency.

Example:

- A19. — Perform sediment tests at irregular intervals, now always made on the first Monday of each month with the retests done on the second Monday (D).

It is not necessary to show sediment test summaries on the survey report. Checking plant follow-up procedures will suffice. Similarly, no report comment is needed when the required tests are performed at another company or private laboratory. Test records should be available for review at the plant that receives the milk.

D. Bacteria Testing Requirements (58.135).

The General Specifications require that the tests be performed at least once per month at irregular intervals. Review §58.135 of the General Specifications for details on test requirements. When the bacterial estimate exceeds 500,000 cells/ml the producer shall be notified with a warning of the excessive bacterial estimate.

When two of the last four consecutive bacterial estimate exceeds 500,000 cells/ml the appropriate State regulatory authority shall be notified and a written notice given to the producer. In addition, another milk sample shall be tested within a period of 3 to 21 days. If the result is more than 500,000 cells/ml, the patron's milk shall be rejected until corrections are made and the bacterial estimate is reduced to 500,000 cells/ml or less.

During the plant survey, determine if these functions are being routinely performed. When the review finds that tests are not performed at least monthly assign the deficiency to category D. When the review finds that there are producers with bacterial estimates above 500,000 cells/ml without the proper follow-up, assign the deficiency to category C.

Examples:

A19. — Run producer bacteria tests at least monthly, no tests for June (D).

A19. — Run retests on producers milk when bacterial estimates exceed 500,000 cells/ml (C).

It is not necessary to show plant bacteria test summaries on the survey report. Checking plant follow-up procedures will suffice. Similarly, no report comment is needed when the required tests are performed at another company or private laboratory. Test records should be available for review at the plant that receives the milk.

E. Quality Records, Farm Follow-up (58.137, 58.138, 58.139, 58.140).

Check that accurate records, listing the results of quality tests of each producer, are kept on file at the plant where the milk is received. Make a cursory review of the records and quality test results, including required retests.

A plant representative should visit each producer of substandard quality milk to inspect milk production conditions and offer assistance for quality improvement. Check that field service assistance is provided for inspecting farms and follow-up on substandard quality tests. If there is failure to make required follow-up visits or poor quality as determined from plant records, recommend increased fieldwork activity to improve milk quality.

Plant management should be encouraged to maintain adequate records regarding farm inspections, follow-up quality calls, etc. to establish that an effective milk quality control program is being applied.

Dairy Grading Branch is concerned with compliance of our regulations that require individual patron records to be available for review. However, we also look for opportunities to eliminate instances where duplication of inspection can be avoided. One area of repeated concern has been the availability of patron records at receiving stations and pump over transfer stations. The following are guidelines for the review and availability of patron records.

1. If the receiving station or pump over transfer station requests to be identified and listed as a cooperative entity which retains control over a patron list and payments for milk received, then full patron quality and field service records shall be available for review. This is required even though the actual testing and field service may be performed by the processing plant receiving the milk. This requirement may be satisfied by one of the three options below:
  - a. Maintain a duplicate set of records at the station location.
  - b. Obtain the complete records from the processing plant during the time of the survey for presentation to the survey inspector.
  - c. The plant survey inspector may travel, at the applicants expense, to the location where the records are maintained. All travel time and expenses will be charged as part of the cost of the survey.
2. If the receiving station or pump over transfer station is owned and operated by a larger cooperative or firm, The Dairy Grading Branch will accept a letter of certification from the main plant or laboratory where the patrons' quality tests are performed and the records maintained. The letter is to certify that all of the milk quality tests, records and farm follow-up procedures required by the *USDA General Specifications for Approved Dairy Plants and Standards for Grades of Dairy Products*, §58.132 through §58.141 are being properly conducted. This letter of certification is to be renewed each year and will be verified by at least one site visit to the laboratory by a USDA inspector, The cost of this verification visit is to be borne by the processing plant responsible for the records or billed directly to the corporate office.

General Specifications §58.138 requires that the first shipment of milk from a new producer or an intermittent milk shipper be tested for bacteria and sediment as well as the usual daily drug residue, odor and appearance checks. If the drug residue, appearance, odor, and sediment results are satisfactory, the milk may be received and subsequent milk shipments shall be tested according to the procedure established for regular shippers.

§58.137 requires exclusion of milk from shippers under the following circumstances:

1. If a new producer's milk is unsatisfactory for appearance, odor, or sediment.
2. If the milk sediment has been #3 or 4 upon daily testing for more than ten calendar days.
3. If three of the last five milk bacterial estimates exceed 500,000 cells/ml.

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4. If three of the last five somatic cell counts exceed 750,000 cells/ml.
5. If the milk has been classified as having a positive test for antibiotics. After a positive result, check that future shipments are not accepted unless tested and found satisfactory.

### F. ADV Testing (58.336c).

Regular ADV testing may be helpful in locating and correcting excessive lipase activity in the raw materials which otherwise could cause lipase or rancid flavor and odor problems in the finished product, particularly cheese and butter. An ADV testing program is not required for plant approval but it is USDA policy to recommend ADV monitoring of raw materials when the butter exhibits progressive type lipase or rancid conditions.

When official grading, keeping quality tests, or free fatty acid tests indicate progressive type lipase or rancid butter conditions, plant status action shall be taken as outlined in Section I.F. of DA Instruction 918-10. The survey should include a thorough review for possible causes. This would include an assessment of raw product age and quality, cream handling temperatures and procedures, pasteurization equipment and procedures, and protection of cream and butter from subsequent contamination. If the survey reveals no immediately apparent cause in the form of faulty plant procedures, equipment, construction, sanitation, or pasteurization, a recommendation should be made for management to immediately initiate an ADV testing regimen on the various sources of milk or cream. Initially at least, each tanker load received should be tested along with screening as necessary of can-handled milk or cream. Laboratory records should be kept. Plant policies should be established regarding acceptable ADV levels in raw product and for follow-up and corrective procedures when these levels are exceeded.

### G. Receiving Tests for Raw Cream (58.336a through f).

If cream is received from other plants, determine if quality checks are made. As a minimum, each tanker load should be subjected to sight, smell, and temperature checks before unloading. A log should be maintained showing relevant information about each load. The plant should also have a regular sampling and testing program concerning other cream quality tests as may be applicable to the type of cream received (tests for acidity, bacteria, coliforms, acid degree value, coarse sediment by the sani-guide test, etc.). Find out if the test results are relayed back to the shipper and if appropriate follow-up action is taken when unsatisfactory results are obtained.

### **Item A20—Milk Pickup Frequency (58.131b, 58.142).**

Milk should not be more than three days old when picked up from the producer and delivered to the plant, receiving station, or transfer station. Cream and whey cream should not be more than four days old when shipped for processing, however for quality purposes, it is strongly recommended that cream and whey cream pickup frequency be limited to a maximum of once every three days.

When a less frequent pickup schedule is noted for these raw materials, make an appropriate recommendation. No criticism is appropriate however, when pickup delays are due to adverse weather conditions, such as storms or snow-blocked roads.

Since this is a “should” item, deficiencies concerning pickup frequency are not serious factors in determining plant status (category D). Nevertheless, the frequent pickup of raw materials should be stressed during plant surveys as a quality promoting measure. Freshness of dairy ingredients is usually directly related to final product quality.

**Item A21—DMC - Commingled Milk (58.143).**

§58.143 of the General Specifications requires that the bacteria estimate of commingled milk in storage tanks shall not exceed 1,000,000/ml. Dairy operations involving the receipt or processing of milk will be subject to the Direct Microscopic Clump (DMC) count test. The record of a plant's commingled milk quality, as determined by official DMC test, is an integral factor in assigning plant status. A DMC average of one million or under for the current survey shall be considered satisfactory. If more than one million, the plant status is directly affected.

The FULL STATUS plant rating is limited to plants that meet the one million requirement on at least two of the last three DMC test averages. Page Z should include a summary of the DMC results from the last three surveys to illustrate the test history.

In the event a plant has received a reduced status assignment due to high DMC results, the manager may want to improve the rating. In this case the manager need not wait until the next cycle inspection, but may request another testing whenever the milk quality has been sufficiently improved. The resampling shall be on an unannounced basis.

**A. Frequency of Sampling for DMC Tests.**

There are two sampling levels for DMC testing, normal and reduced:

**1. Normal sampling level (each survey).**

During each survey, except timely follow-up surveys after the assignment of the INELIGIBLE, NO STATUS ASSIGNED, or PROBATIONARY-10 DAYS status, provided that the reduction in status was not based on the DMC test results.

**2. Reduced sampling level (1 sample per year).**

A reduced level of sampling will apply when the average DMC results are one million or below on the previous three consecutive sets of samples. When a plant qualifies for the reduced level, take only one set of samples at any survey performed during the following calendar year. The subsequent yearly samples shall be taken at varied seasons of the year to represent both summer and winter milk quality (not every other survey). This yearly sampling rate may be continued indefinitely, as long as the average result is one million or below. Whenever

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sampling yields a DMC average above one million, the normal level of sampling shall be resumed and continued until three successive averages are one million or less.

To determine if a plant is on normal or reduced sampling, the inspector shall review the previous survey transmittal letter that shows the plant DMC history. When DMC samples are not required, the inspector shall show a dash in the satisfactory column for this item and the following comment:

A21. — No samples taken. Plant is on reduced testing.

When no samples are taken for DMC testing during a plant survey, prepare form DA-144 as shown in Exhibit A1. However, do not mail the form to the laboratory: send it with the survey report to the National Field Office. Different comments can be used as appropriate in the remarks section (e.g., no milk available for sampling, milk is received only every other day, etc.).

### B. Sampling Procedures.

When a plant receives whole milk, collect only commingled whole milk samples, do not obtain samples of skim milk processed from this whole milk. In drying plants that receive only skim milk, obtain samples from skim storage tanks. Be certain that the milk in storage tanks has been thoroughly mixed prior to obtaining the sample.

Obtain three(3) samples of commingled milk. When more than three filled storage tanks are available, randomly select three tanks for sampling on a predetermined basis (Exhibit A2). If milk is stored in only one storage tank, obtain three samples from the same tank at the same time. When a single tank is used on an "in and out" basis, obtain the three samples at different times and identify them accordingly (Exhibit A3).

Some cheese plants (particularly Swiss and cottage cheese) add lactic culture to the milk in the storage tanks. Where this is practiced, arrange with the manager for taking the raw milk samples before the culture is added.

Samples shall only be taken from storage tanks in the plant that contain commingled milk. Sampling from bulk trucks would tend to give unfair advantage to those plants because the milk would be fresher, less pumping and handling, etc. The only exception is at transfer stations that do not have milk storage tanks. At such transfer stations, bulk truck tanks may be sampled provided that the milk is reasonably well agitated and is not creamed off (Exhibit A4).

Take samples in a sanitary manner. Physical cleanliness of surfaces contacting the milk is important although absolute sterility is not necessary. Sanitize the sampling valve on the storage tanks by using a clean brush and brushing the outlet area of the valve with a 200-ppm chlorine solution or equally suitable sanitizing solution. Using a 6 to 8-quart container, drain out approximately 2 to 5 quarts of milk to obtain a thorough flushing. Following this, collect the sample into a sterile sample container by placing the bag under the outlet and carefully drawing

milk from the valve. Alternately, the samples can be taken by a qualified plant employee, follow the plants request in this regard.

When sampling from tank trucks at transfer stations, sampling from the top may be easier than sanitizing the outlet value and sampling at that point. Milk may be withdrawn from the top with a single service sampling straw or a sanitary dipper (supplied by the plant). If a dipper is used, sanitize it with a chlorine solution or other suitable sanitizer, then rinse it twice in the milk before pouring the sample into the sample container.

In instances where a number of holding tanks are available for sampling, collecting the samples from all the tanks before continuing is satisfactory. Do not hold or store samples prior to applying smears to the slide for more than 20 minutes without refrigeration.

### C. Preparing the Slide.

Be sure that the sample is properly mixed so as to be homogeneous and then transfer milk to the slide using a glass capillary tube calibrated to deliver 0.01 ml. of raw milk. USDA resident inspectors may optionally use a 0.01 ml. stainless steel syringe or pipet to transfer the milk (use of these is limited to USDA laboratories where facilities are available for special cleaning, care, and calibration).

Check the slide to make sure it is clean and free from dust. The sample of milk should be applied to the same side on which the glass is etched. Do not get finger prints on the areas where the milk film is to be applied. Using a pencil, write the plant number, your initials, the date, and identify the sample areas on the slide with numbers (1 through 3) corresponding to identification on form DA-144. Place the slide on the drying box and plug the box in. The drying box should be level to insure that the film dries uniformly.

To transfer test portions to the slide, dip the tip of the capillary tube just below the surface (excluding foam). Capillary action should draw the milk into the tube (the tube should be full, tapping the rubber bulb will sometimes help). Wipe any foam from the exterior of the tube with a clean dry paper towel being careful not to remove any of the sample from the tube.

Place the tip near the center of area to be covered and carefully expel the 0.01 test portion. The hole in the top of the rubber bulb needs to be covered to expel the sample. With a clean, bent needle (a sanitized paper clip may be used), promptly spread the sample uniformly over the entire square-centimeter area. Wipe the needle between samples on a clean dry paper towel or dip it in a sanitizer solution. Use a new tube for each sample. The film should be dry within five minutes.

### D. Preparation of Form DA-144.

Information on the form should include the name, location, and number of the plant, date sampled, whether whole or skim milk, temperature of milk, and the signature of inspector. In addition, show any information that may further relate to the test results, such as whether it is

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holdover milk, grade A or B milk, or if milk has been transferred from a receiving station (see Exhibits A1 through A4).

Attach one copy to the survey report. Do not remove the carbons from the rest of the copies. Carefully wrap them around the slide and pack into the mailing tube, additional paper should be added as necessary to prevent breakage in the mail.

Plant inspectors should send the slides to the laboratory on a daily basis using prepaid labels. Prompt mailing is necessary to enable the National Field Office to show the results on the corresponding plant survey report without delay. Resident graders will forward one copy of form DA-144 showing test results to the National Field Office with the survey report and retain one copy.

The mailing tubes, and slides will be reused and will be returned by the laboratory to the National Field Office for distribution to the individual inspectors.

## **Raw Product Storage**

### **Item A24—Room Construction (58.126, 58.146d).**

See the guidelines for Item A1—Room Construction.

For purposes of salmonella and listeria control, personnel traffic through the storage, processing, and packaging areas should be held to a minimum. Milk truck drivers, fieldmen, and farmers should not walk through these areas since contamination on shoes and clothing may be carried from farm animals which are a major source of contamination. The plant should take proper precautions to minimize or control personnel traffic through the plant.

### **Item A25—Lighting & Ventilation (58.126d, e).**

See the guidelines for Item A2—Lighting & Ventilation.

### **Item A26—Pumps, Pipelines, & Valves (58.128, 58.131d, 58.146a).**

See the guidelines for Item A3—Pump, Pipelines, & Valves.

### **Item A27—Product Cooler (58.128a, i, j, k).**

Most coolers (heat exchangers) for raw products are one of the following three types. They may be effectively cleaned by proper recirculation procedures (mechanical cleaning). However, unless there is an effective strainer, filter, or clarifier upstream from the unit, proper rinsing of extraneous material from the equipment may be a serious problem, particularly with plate type units which are pressed tightly together.

#### **A. Plate type (58.128j).**

Plate type heat exchangers shall comply with *the 3-A Sanitary Standards for Plate Type Heat Exchangers for Milk and Milk Products, Number 11- .*

Plate heater exchangers shall be completely disassembled for inspection of the product side of each plate during the survey. Arrange to be present during the dismantling and opening of the heat exchanger. If the unit is clean, check this item satisfactory. If plates are dirty recommend daily opening for inspection and any needed hand cleaning until an adequate recirculation cleaning procedure has been established. If the plates are clean except for loose extraneous material (gasket particles, hair, insects, filter fragments, etc.), recommend daily dismantling for inspection and rinsing, or providing a filter, strainer or clarifier upstream from the heater exchanger.

Plate gaskets which are flattened should not be criticized if they are still resilient and effectively prevent leakage. However, when gaskets are loose, checked, leaky, deteriorated, sloughing off, etc., regasketing should be recommended.

B. Tubular type (58.128k).

Tubular heat exchangers shall comply with *3-A Sanitary Standards for Tubular Heat Exchangers for Milk and Milk Products, Number 12-* (formerly a “should” item).

This requirement applies to new installations of heat exchangers for either heating or cooling of product. Do not criticize existing “non-3-A” heat exchangers which are constructed in a sanitary manner, are in good condition, and are found to be clean. Similarly, do not criticize good condition, sanitary “non-3-A” heat exchangers which are simply relocated within the same plant. This would not be considered a new installation.

1. Single tube type.

Inspection may be accomplished by checking only one or two tubes in a unit. If found clean and gaskets are okay, check the item satisfactory. Rinsing of extraneous material from tubular equipment is not usually a problem due to lack of restrictions in the path of product flow.

Recirculation cleaning of tubular type heat exchangers without daily dismantling is a satisfactory practice when an effective cleaning regimen has been established and when suitable rubber or plastic gaskets are used for end caps or heads. If inspection reveals dirty product contact surfaces or paper gaskets, recommend daily take-down for further cleaning and for gasket replacement until suitable corrections are made.

2. Triple or double tube type (Tube within a tube).

These units usually clean very effectively with proper recirculation procedures, but there may be problems with hangup of loose extraneous material at the close-tolerance dimpled areas between tube sections. To inspect a triple tube unit, ask management to dismantle one horizontal assembly of tubes. Elbows at each end must be removed. Be present to inspect tube sections as they are slid apart (they need not be fully removed for inspection). Also, check condition of the gaskets and seals.

If the tubes are not clean recommend improvement of the cleaning regimen and subsequent daily inspection to make sure it is effective. If the tube surfaces are clean, but there is loose extraneous material present, recommend provision of an upstream filter device. Another, but less effective, alternative is reversal of cleaning solution flow during the cleaning regimen. This will tend to dislodge loose material which is hung up on the tube dimples.

Some “Multi-tube” type heat exchangers have fully welded elbows. Dismantling for inspection is not possible. These units are acceptable if they have 3-A symbol authorization under *3-A Sanitary Standards for Tubular Heat Exchangers for Milk and Milk Products, Number 12-*. As per the fabrication section, accessibility for inspection is not required if the heat exchange surface is one continuous tube and the tubular heat exchanger is designed to be mechanically cleaned. Since inspection of interior milk contact surfaces is not possible, check the inlet and outlet and that the mechanical cleaning procedure is well conceived and controlled. This can

be demonstrated by either a programmed CIP system or by recording thermometer charts showing good manual control of the cleaning regimen.

Tubular heat exchangers with corrugated tubes are acceptable if the unit is drainable.

C. Cabinet surface cooler type (58.128i).

If a surface cooler is used, it shall be the enclosed cabinet type. Inspect sanitation and general condition of plate surfaces, distribution pipe, distribution tray and product collection trough. When recommendations are necessary regarding dirty product contact surfaces, also indicate the seriousness of the sanitation deficiency on the survey report (slight or definite milkstone, slight amount of extraneous material, plugged plates, etc.). If the cooler is the type that requires drip deflector plates, check that they are being used and are installed properly.

Also, inspect the exterior surfaces of coolers for condition and cleanliness.

D. Scraped Surface (58.128o).

Scraped surface heat exchangers shall comply with *3-A Sanitary Standards for Scraped Surface Heat Exchangers, Number 31-* .

Scraped surface heat exchangers are not normally used as a product cooler for raw milk due to the low viscosity of the product.

Scraped surface heat exchangers shall be disassembled so the sanitary seals and internal parts can be fully inspected. Pay particular attention to the seal design, which is often internal, and sanitation. All seal parts shall be readily accessible for cleaning and inspection. Check the interior of the heat exchange barrel for pitting, scoring or delamination of the plating. Scraper blades shall be free of nicks and burrs, and be easily disassembled. Make recommendations as appropriate. When inspecting scraped surface heat exchangers, caution must be exercised as the scraper blades are extremely sharp and can cause serious injury. Do not handle these components. Have an experienced plant employee conduct the disassembly operation.

**Item A28—Storage Tanks - Silo (58.128d, 58.143, 58.232).**

New or replacement silo tanks shall comply with *3-A Sanitary Standards for Silo-Type Storage Tanks for Milk and Milk Products, Number 22-* .

An indicating thermometer for milk temperature is required. The temperature of the milk in the storage tanks shall be maintained at 45°F or lower unless processed within two hours.

The appendix to the 3-A Sanitary Standards for Silo-Type Storage Tanks states that a separate, accurate, seven-day recorder should be provided on all tanks to record temperatures during the filling, storage, emptying, and cleaning periods. Silo tanks, however, can receive 3-A approval and carry the 3-A symbol without provision of the recorder, since the wording is a “should” item in the appendix. In the past, absence of the recorder was not considered a deficiency. The

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tendency in the dairy industry, however, is toward larger supplies of milk to be received for processing and more careful monitoring of the milk supply and storage conditions is necessary. If a seven-day recorder is not provided, recommend that one be furnished and assign the deficiency to category D.

The recording charts should be identified by date, silo number, and operator's signature or initials. Review the charts to see that they are being used and properly identified. When charts are not properly notated or if a temperature regulator or recorder is not present make a recommendation for correction.

Silo tanks shall be designed to be cleaned in place (CIP), manual cleaning procedures are not permitted; therefore, a solution temperature sensor and recorder shall be provided. The cleaning solution temperature shall be automatically controlled to maintain proper temperature for best cleaning performance as recommended by the cleaning compound manufacturer and to avoid exceeding the maximum temperature specified by the silo tank manufacturer. Since all surfaces of the tank are not easily available for close visual inspection, the recorder chart provides a record of the applied cleaning regimen. The sensing element of the recording thermometer shall be located in the solution return line.<sup>1</sup>

A separate solution supply tank is desirable for accurate preparation of solution strength, and to prevent pitting or discoloration of tank surfaces where chemicals would otherwise be added. The separate solution tank also permits keeping the solution level very low in the silo to provide maximum cascade cleaning effect on the bottom and lower side wall areas. Solution temperature adjustment is another function easily handled in the solution tank. At many plants, central type CIP pipeline cleaning facilities are utilized to clean silo tanks. These facilities usually have separate solution and rinse tanks, automatic temperature control, and recorder. (Some also have automatic programmers.) Although such facilities are certainly desirable, the separate solution tank is not mandatory if other requirements are met (suitable pump, automatic temperature control, and recorder), and if effective tank cleaning is being accomplished. However, if the inspection reveals deficiencies with tank cleaning, tank damage from chemicals, undissolved cleaning materials, inadequate rinsing, etc., recommend that a separate solution tank be provided.

If air agitation is used, the equipment for producing and introducing the air into the silo shall comply with *3-A Accepted Practices for Supplying Air Under Pressure in Contact With Milk, Milk Products and Product Contact Surfaces, Number 604-* . This document outlines the requirements for producing the compressed air and for subsequent trapping, filtering, and piping of the air to the point of application. An air intake filter is required ahead of the compressor and a second disposable media filter is necessary in the air pipeline close to the point of introduction. It is not necessary to determine 3-A compliance of such filters however; if missing,

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<sup>1</sup>Although the sensor for the recording thermometer is located in the solution return line this is not a good place to locate the sensor which controls the cleaning solution temperature. The very large surface area of a silo tank can cool the cleaning solution and a sensor so located would erroneously call for ever-hotter solution which might damage the tank. Temperature control sensors should be located in the solution tank or downstream from an in-line solution heater before introduction to the tank.

recommend that filters be provided. Also, be sure to check daily sanitation on the milk side of air introduction piping back to and including the sanitary check valve. When deficiencies are noted, recommend correction.

Inspect the outlet valve, sampling valve, manhole cover and gasket, as well as the overflow or vent lines which terminate in the alcove area. Use a high intensity spot light to inspect the tank lining for condition and cleanliness. If the dome or liner is dirty or streaked, arrange with management for inspection of the cleaning device located in the dome. Partial plugging of the device is often responsible for poor cleaning performance. This might be remedied by provision of a filter in the cleaning solution tank or line. Means of access to the top of the tank(s) should also be provided to allow easy periodic checks of top cleaning devices and to replace gaskets in associated pipe fittings.

In the case of vacuum buckling or other interior liner damage, there is danger of cracks which would permit leakage into the jacket insulation. Report the extent and seriousness of the buckling, and whether cleaning is adversely affected. Also check the jacket weep holes at the bottom of the tank for product or cleaning solution seepage. If satisfactory cleaning cannot be achieved because of the damage, or seepage is noted, the tank should be taken out of service until repairs are made.

Some shaft and seal assemblies of horizontally mounted mechanical agitators are designed for CIP, some require dismantling and hand cleaning each time the silo is washed. In either case, have the agitator removed for sanitation checks when inspecting the silo.

There is no USDA regulation concerning the maximum age of milk for processing. Storageability of milk depends on many factors, including initial quality, care of handling, and temperature of storage. Therefore, do not criticize extended storage periods for milk (for instance, weekend holdover to accommodate a five or six day work week) when the milk temperature records are satisfactory. Extended milk storage may be discussed with management, but is not unsatisfactory unless there is evidence of quality deterioration in the milk or final manufactured product. Although there are no specific limits for milk storage, it is nevertheless USDA policy to encourage prompt milk processing and also that raw milk storage tanks be washed at least every 72 hours. If the interval is longer than this make appropriate recommendations and assign the deficiency to category D.

When a tank is used for surge tank purposes or when a tank is partially emptied and then later refilled, it should be completely emptied and cleaned daily. Foam and milk residues left on the tank lining may warm up considerably, allowing bacterial development, and then be reintroduced to fresh milk upon tank refilling. Examples of tank use which require daily cleaning are: 1) the whole milk supply tank ahead of a separator or HTST pasteurizer and 2) adding of fresh milk into a tank only partially emptied the day before.

The first 3-A Sanitary Standards for Silo-Type Storage Tanks were assigned serial #2200 and became effective 2/10/65. They required the control area and alcove to be in a "processing area or acceptable tank truck receiving area" and all appurtenances and the terminal end of the vent lines were required to be in the control area. Revision #22-03 became effective 1/5/74 and

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was changed to require that the control area and alcove be in a processing area or an area in the plant at least the equivalent of a processing area. During the 1965-1974 period, quite a few silo type tanks were installed with alcoves opening into tank truck receiving areas, in conformance with the then effective 3-A Sanitary Standards.

Although such installations are grandfathered, recommend either; 1) that the tanks be provided with filters for vent lines which terminate in the now unsatisfactory area or 2) relocate the silo so that the control area and alcove are part of a processing area (see appendix K of the 3-A Sanitary Standard). If management decides to provide filters, caution that their design and maintenance be in accordance with the recommendations of the tank manufacturer. Proper venting under all conditions is extremely important to avoid tank damage or collapse due to vacuum.

After 1974, some tanks still were constructed with control areas and alcoves located outside of a processing area or its equivalent. Handle these tanks in the same manner as for the tanks constructed between 1965-1974.

However, all silo tanks installed new or moved from an existing location after 11/19/92 are required to be either; 1) provided with a control area and alcove located in a processing area or its equivalent or 2) the vent lines shall terminate in a processing area or its equivalent. If these requirements are not met make appropriate recommendations. Vent lines terminating in an unsatisfactory area are not acceptable for tanks installed or moved after this date (category C deficiency).

### **Item A29—Storage Tanks - Horizontal (58.128d, 58.143, 58.232).**

New or replacement milk storage tanks shall comply with either *3-A Sanitary Standards for Storage Tanks for Milk and Milk Products, Number 01-* , or *3-A Sanitary Standards for Uninsulated Tanks for Milk and Milk Products, Number 32-* .

*3-A Sanitary Standards for Farm Milk Cooling and Holding Tanks, Number 13-* and *3-A Sanitary Standards for Farm Milk Storage Tanks, Number 30-* concern tanks for farm use. However, cooling and storage tanks conforming with these standards are being used in dairy plants for such uses as holding whey cream at cheese plants and condensed skim milk or cream at evaporated milk plants. Such dairy plant use of farm-type tanks complying with the applicable 3-A Sanitary Standard is satisfactory, provided that the tanks are in satisfactory condition, are adequate for the cooling and storage function required, and are maintained in sanitary condition.

An indicating thermometer for milk temperature is required. The temperature of the milk in the storage tanks shall be maintained at 45°F or lower, unless processed within two hours. Also, review the relevant paragraphs of Item A28—Storage Tanks - Silo, for guidance regarding a recording thermometer, the holding time of milk, the maximum time period between washes of a milk storage tank, the use of a CIP solution makeup tank, the location of the tanks (receiving area verses a processing area), etc.

Storage tanks should be inspected as they become empty and are washed during the course of the survey. Use a spotlight or flashlight to carefully check interior surfaces and particularly the accessory fittings such as gauge pipes, sampling valve, agitator shafts and seals, and outlet valves. Report any deficiencies with sanitation or condition.

Inspect the exterior surfaces of the tank. The jacket should be clean, well painted (unless stainless steel) and free of rusted out areas which might cause off-odors or harbor insects.

When top fittings cannot be easily reached from the floor, the tank should have attached steps or ladder and hand holds or hand rails for easy access. When needed, recommend that such means of easy access be provided to facilitate the necessary cleaning of special accessory fittings and sight glasses.

The 3-A Sanitary Standards for the various types of milk storage tanks all require agitators to be removable or accessible for manual cleaning, or designed for mechanical cleaning. Also, the annular opening around the agitator shaft shall be protected by an umbrella or drip shield of sanitary design.

Tanks that have nonremovable type agitators with old style packing glands are unsatisfactory, recommend conversion to easily removable couplings and a sanitary type seal for easy removal and cleaning. When this type of seal or agitator is noted in the product contact zone of vats, tanks, or other dairy equipment used for fluid products it shall be considered a category B deficiency.

When vertical type agitators are located out-of-doors, check that the annular opening for the shaft is adequately protected against entrance of contaminants. Tanks constructed to 3-A Sanitary Standards are required to have a sanitary seal at this area. If the shaft opening is not suitably protected against the entrance of dust, moisture, insects, oil or grease, recommend correction.

Top mounted agitators may be effectively cleaned in place or may require dismantling for hand brushing, depending upon design. If there is a sleeve coupling located within the tank, daily dismantling is necessary. Such couplings cannot be cleaned by spray-ball tank cleaning procedures and should be removed for inspection during each survey. Inspect all parts carefully for condition and sanitation, including any bottom bushings or guides.

The inspection of the top mounted agitators may require entering the tank. As with all equipment that is entered for inspection, exercise extreme caution and follow the plants confined space entry program (see the guidelines for Section I Item P). Do not enter the equipment without a positive lock on the starting switches and controls. After inspecting, remind management that the tank will have to be recleaned and rinsed before use (sanitizing raw product storage tanks is a "should" item of §58.146a).

When the face of a horizontal tank is bulkheaded through a processing room wall, the tank vent fittings should be located within the room for easy access for cleaning. When located outdoors, recommend that such opening(s) be closed and a new vent installed inside the plant.

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Pfaudler 45° outlet valves are satisfactory only if they are in good condition, can be easily dismantled, and are being taken apart daily for hand brushing. Proper cleaning of this type of valve requires removal of the entire valve assembly from the tank. Describe any deficiencies.

Remove manhole gaskets and sight and light port gaskets to inspect for condition and cleanliness. Describe any deficiencies and make appropriate recommendations. Gaskets that are cut, checked, or otherwise deteriorated should be replaced.

If the tank is cleaned manually, adequate lighting inside the tank is necessary. Such lighting is usually provided by a light source shining through a top front light port. When missing, recommend providing adequate lighting.

When the tank is mechanically cleaned, the solution recirculating system is not required to have automatic temperature control or a recording thermometer. The milk contact surfaces are available for inspection after the cleaning procedure, so these extra safeguards are not mandatory. Nevertheless, many companies supply them for added assurance of uniform mechanical cleaning conditions.

### Note:

The automatic temperature control and recorder are required when product pipelines are cleaned in place along with the mechanical cleaning of the tank. Review guidelines for Item A32–CIP System(s).

Mechanical cleaning of tanks is usually effective only on the liner surfaces; special accessory fittings must be cleaned by dismantling and hand brushing. Inspect all such fittings carefully.

If tank spray cleaning devices are permanently mounted, any pipeline joints inside the tank should be welded or be fastened with specially designed loose joints that will clean in place. Hex nut or clamp type pipeline fittings are not satisfactory for this purpose. Check that spray cleaning devices are clean and free of debris. Where plugging of spray devices is a problem, a strainer in the solution recirculating system should be recommended.

Direct reading gauges of the transparent glass or plastic type are satisfactory if they are 1) readily accessible for cleaning or are designed for mechanical cleaning, and 2) constructed so that all product in the gauge may be discarded rather than reentering the tank. Check that such gauges are maintained in clean condition. See fabrication section of *3-A Sanitary Standards for Storage Tanks for Milk and Milk Products, Number 01-* for design and construction criteria applicable to direct reading gauges.

Existing glass-lined tanks are acceptable only when the glass surface is in good condition, free of cracked, chipped or rusty areas. Check particularly at points where valve or accessory fittings are fastened. Repair of damaged glass surfaces has not proved satisfactory, so when unsatisfactory conditions are noted, recommend replacement with a stainless steel tank conforming with the applicable 3-A Sanitary Standards.

Fiberglass or plastic are not acceptable construction materials for linings of tanks to be used for milk, cream, whey or other fluid dairy products. The applicable 3-A Sanitary Standards require stainless steel construction for such product contact surfaces. If fiberglass or plastic construction is noted recommend replacement with "3-A" tanks. Do not criticize good condition fiberglass construction for tanks for handling brine, brine and cheese, cleaning compounds (caustic, acids, etc.), water, liquid sweeteners, jackets of tanks, etc.

**Item A30—Housekeeping (58.126e, 58.127f, 58.146d).**

See the guidelines for Item A7—Housekeeping.

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## General Items

### Item A31—Source Ingredients (58.101d, 58.141).

Approval of some dairy manufacturing operations requires approval of their regular source plants for dairy ingredients.

Examples:

1. Milk receiving stations which receive can or bulk milk into a plant for cooling (when necessary), temporary storage, and shipment to a manufactured products plant which wishes USDA approval. Milk transfer stations are also subject to inspection.
2. Plants which supply any dairy ingredient used to standardize a products composition.
3. Condensing operations which ship product to a central drying plant, evaporated milk plant, or cheese plant.
4. Cheese factories which ship whey, condensed whey, sweet cream, or whey cream to an approved plant for further processing.
5. Buttermilk sources for manufacturing of dry buttermilk.
6. Cream sources for butter plants.
7. Lactose manufacturing plants which ship product to an approved plant for further processing or for use as an ingredient or flow agent for instantizing. Plants which package lactose under a "P" code are not approved sources.

Such source plants shall be USDA inspected and approved. Receiving dairy products from unapproved or "P" code plants shall be considered a category A deficiency for the processing plant which receives the raw material unless the product is covered by a USDA certificate. Show this item as unsatisfactory and recommend that dairy products be obtained only from USDA approved plants. Following the recommendation, show information about the unapproved sources, amount of products received, etc. This requirement is not intended to apply to occasional or irregular interplant shipments of milk caused by strikes, equipment breakdowns, etc., as explained below.

An exception is made to the above policy for finished products containing foreign casein or caseinate. Such products may be approved for the "S" or "P" code, whichever is appropriate.

When the plant is receiving products such as cheese, butter, butteroil, nonfat dry milk, lactose, MPC (milk protein concentrate), TMP (total milk proteinate), etc. from unapproved sources

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(including foreign countries) for distribution, further processing, or repackaging, the plant may not be approved for official grading service for that product code nor for any product code that could contain the unapproved dairy ingredient. However, a “P” code approval can be assigned provided the facilities satisfactorily comply with the appropriate plant survey requirements and the products are being satisfactorily handled during processing. In this case assign the INELIGIBLE status to all the codes affected by the unapproved ingredients and assign status for the appropriate “P” code.

### Note:

Source plants for dairy ingredients need not be USDA approved when the plant desires only “P” code approval. Under those circumstances, of course, the resulting finished product may not be officially graded without continuous inspection. See Section I, Item G for further details.

All products from unapproved sources in “P” code plants must also comply with the wholesomeness requirements as outlined under Item A34—Sanitary Practices below.

To avoid inspection duplication, properly labeled bulk shipments of milk, cream, or other dairy ingredients from Grade A plants on the IMS list are generally exempt from the above-mentioned requirement. For bulk products to be properly labeled, the bill of lading shall declare the product to be Grade A. Such products are produced under a “comparable or higher” quality program as provided under §58.141 and waiving the USDA inspection avoids unnecessary duplication of plant inspections. There may be instances however, where the Grade A dairy products quality deteriorates after it leaves the quality purview of the Grade A authorities as “surplus product.” The quality may suffer because of aging, excessive handling, warming, transport in unclean tankers, or addition of milk from degraded Grade A producers. When there are quality problems with Grade A dairy products received at USDA inspected manufacturing plants, the National Field Director may require USDA inspection of the source plant. Such surveys would be limited mainly to the Grade A plant areas and functions concerned with the surplus products.

§58.101d also permits the receipt of occasional shipments of bulk milk from unapproved sources, provided that the milk is tested and meets the quality requirements. A bacteria test, in addition to the required antibiotic test, on each tanker load of such milk would suffice. The DMC test is suggested for minimum holdup of the truck. Milk shipments with DMC results of one million or lower may be accepted. Check the outside receiving records for the previous two to three weeks and determine if there were any occasional shipments of milk from unapproved plants. If so, determine if they were tested. If such shipments are being received into the plant without prior testing, Item A19—Raw Products Testing is unsatisfactory, recommend that bacteria testing be required prior to unloading future occasional shipments of milk from unapproved sources.

The quality of dairy products from approved supply plants should not be overlooked. Examine the manufacturing plant records to determine quality of dairy products received from supply

plants. When the manufacturing plant is not testing dairy products from supply plants for quality, show as unsatisfactory and recommend that a testing program be started and test records maintained. The plant records should show source of products, date received, temperature when received, and results of tests. Unsatisfactory test results should be reported to the shipper for appropriate follow-up (see the guidelines for Item A19—Raw Products Testing).

Quality tests on milk from receiving stations for bacteria should be at a frequency necessary to assure receipt of satisfactory quality milk. The need for testing may vary considerably. When the milk source exhibits erratic bacterial quality, sampling and testing of each tanker load would be appropriate. However, when a supply plant has a good quality history, less intensive sampling and testing, perhaps twice weekly, may be sufficient. Some manufacturing plants do not receive milk from their own producers but instead order it as needed from a broker, milk pool, or producer association. Often such milk is Grade A and is hauled direct from the producers. When milk from a supply source has been of consistently satisfactory quality, only occasional spot check testing would suffice.

Review plant records for the bacteria tests performed on tanker milk received during the previous week. If all results are below one million, check the item satisfactory. Showing of tanker test results on the report is not necessary unless to support a recommendation for improving milk quality. For example; "Arrange for improvement of quality of milk received from Red & White Milk Haulers. (Four of eleven tankers received June 1-8 had DMC in excess of one million)."

**Item A32—CIP System(s) (58.128a, 58.146a).**

CIP cleaning, if used for pipelines, shall be in accordance with *3-A Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems, Used in Milk and Milk Product Processing Plants, Number 605-*. When equipment is mechanically cleaned by recirculation or spray devices, any recommendations about the effectiveness of such cleaning should be shown on the report under the item number covering the equipment.

Study the 3-A Accepted Practice so you will be thoroughly familiar with the requirements. Check especially for the following deficiencies which are frequently encountered in CIP pipeline cleaning systems (deficiency categories shown should be considered guidelines, the actual category assigned during the survey may be different depending on the severity of the deficiency):

1. Use of conventional fittings rather than the required CIP fittings or welded joints (category D if the fittings are clean).
2. Failure to provide slope for drainage (category D deficiency).
3. Inadequate pipeline supports, use of wire for supports or supports too far apart allowing sags, etc. (category D deficiency).

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4. Supports should not allow electrolytic action between support and pipeline. Supports may be made of stainless steel, or should have rubber or plastic contact points with the pipeline (category D deficiency).
5. No automatic temperature control for solution (category C deficiency), although this is required for pipelines it is optional for storage tanks.
6. No recording thermometer (category C deficiency), type of recorder required is outlined in section F.4 of the 3-A document.
7. Poor condition gaskets and dirty exterior surfaces (category D deficiency). Even CIP pipelines should be dismantled occasionally to check gasket condition and to clean outside surfaces, frequency of dismantling may vary considerable from plant to plant depending on type of gaskets, product, and environmental conditions.
8. Inadequate solution velocity. This is usually caused by improper sizing of the recirculating pump. When solution velocity is suspected as a cause of inadequate CIP cleaning, refer management to the simple method of determining velocity as outlined in the 3-A Accepted Practices. The time required to fill a ten-gallon can with solution through a given pipe size will indicate solution velocity (should be at least 5 ft. per second) (category of deficiency depends on actual cleaning performance).
9. Failure to monitor cleaning effectiveness (category of deficiency depends on actual cleaning performance).

These or any other 3-A noncompliance items should be checked unsatisfactory and appropriate recommendation made. Unless specific problems are involved, do not show information on the report pertaining to the actual time-temperature cleaning cycle being used.

To achieve satisfactory cleaning and to prevent pipeline corrosion, the recommendations of the cleaning compound manufacturer should be followed with respect to time, temperature, and concentration of cleaning and sanitizing solutions. Do not show information on the report about actual time-temperature treatments being used unless needed to illustrate specific problems. When cleaning deficiencies are evident, recommend that the CIP cleaning procedures be revised immediately to obtain satisfactory cleaning performance and that pipelines be inspected daily after CIP cleaning until a history of satisfactory cleaning has been established.

Storage and piping facilities for cleaning solutions shall include adequate safeguards to prevent mixing of solutions with food products. When it is necessary to clean pipelines while milk is stored in adjacent tanks, pipes, or other equipment, any cross connections should be dismantled or the CIP system should have other effective controls to prevent accidental mixing with the milk. Separation of cleaning solution from the product is usually achieved by provision of "make-break" connections for hookup, swing type elbows, separate solution return pipelines, electrical interlocks which prevent operation if improperly connected, block-and-bleed systems (see the guidelines for Item A3—Pumps, Pipelines, & Valves), etc. When adequate safeguards

are not used, recommend correction. When you are in doubt about a system, study the details carefully and discuss them with your supervisor for guidance.

Hex-nut fittings which have had the bevel-seat regrooved to use self-positioning gaskets and form joints with a substantially smooth, flush interior surface are acceptable as CIP fittings. However, when such fittings are used, it is extremely important that any conventional hex-nut, bevel seat fittings are dismantled for hand cleaning. Since the bevel-seat fittings cannot be distinguished from the regrooved CIP fittings by exterior appearance, circuit drawings should be posted to clearly indicate to plant employees (and the inspector) which fittings are to be cleaned in place and which require daily hand cleaning. Inspect non-CIP fittings for cleanliness, also inspect some regrooved CIP fittings for condition of CIP gaskets and for regrooving workmanship. When applicable make recommendations for correction.

Notes:

1. John Perry fittings are acceptable CIP type fittings. These are hex-nut type fittings which have factory-made, CIP type, gasketed, seats. (Field regrooving not necessary.) However, since these fittings cannot be distinguished from conventional bevel seat fittings by exterior appearance, the posting of CIP circuit details and inspection of fittings should be as outlined above for regrooved hex nut fittings.
2. Heat resistant glass (Pyrex) is an acceptable "3-A" construction material for CIP pipelines.
3. Automatic programming of the CIP regimen for pipelines is not a 3-A or USDA requirement. Provision of such equipment is optional (except for membrane systems). When the regimen is manually controlled, the recorder charts provide evidence of the times and temperatures actually employed.

The 3-A Accepted Practices require that a drawing showing details of each circuit and a description of the cleaning regimen "be made available by the processor." When the CIP circuit(s) is large and complex, you may request provision of such drawing to aid in making the inspection. Posting of such drawings and procedures for use by employees should also be recommended when inspection reveals erratic cleaning performance, or lack of uniformity by employees in following the correct cleaning regimen.

For cleaning pipelines in place, 3-A Accepted Practices requires a recording thermometer. Applicable specifications for the thermometer are outlined in the practice. These specifications are not met in all respects by an HTST pasteurizer recorder, nevertheless, this recorder will suffice to monitor CIP cleaning of the pasteurizer and the pipes that are cleaned in the same circuit with the pasteurizer. When the pasteurizer cleaning circuit includes a very long flow diversion line or other additional piping unrelated to the pasteurizer, recommend provision of a separate recorder meeting specifications of the applicable section of the 3-A Accepted Practices and that its sensor be placed at the coolest part of the circuit.

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Cleaning solution tanks must be made of stainless steel or suitable, equally corrosion-resistant metal. Interior finish may be No. 2B mill finish (unpolished) or may be polished to No. 4 finish with 150 grit silicon carbide. There is no guidance in 3-A Accepted Practices concerning covers for solution tanks. Covers are optional but recommended unless the tanks are located in an area where additional protection against contamination is needed. In such instance, recommend provision of covers.

The 3-A Accepted Practices has no requirement for a strainer or filter in the solution circuit. However, if inspection of cleaned pipelines reveals extraneous material such as filter or gasket particles, brush bristles, etc., recommend installation of a strainer to retain such debris. If a strainer is provided, a handy location should be chosen to facilitate periodic cleaning.

The 3-A Accepted Practices outlines the criteria for solution contact surfaces. These criteria are not materially different from the criteria for product contact surfaces. Dairy Grading Branch interpretation of these criteria is that all solution contact surfaces, except those castings identified in section D.3.1 (revision 605-04), shall be the equivalent to product contact surface criteria. The listed exception is for cast stainless steel surfaces on heat exchangers, steam injectors, and pumps. These cast surfaces are somewhat rougher than a No. 4 finish. Routine inspection of this equipment not required during USDA plant surveys.

### **Item A33—Storage of Supplies (58.126e, 58.153, 58.241d).**

Check construction, lighting and ventilation in the supply room or area. Give specific attention to see that the area is protected against entrance of rodents or insects. Doors and openings shall be fitted tightly and floors kept in good repair. Storage room floors where new containers and supplies, packaged dry products, or equipment is stored can be constructed of sound, smooth wood that can be kept clean.

#### **A. Salt, Color, Starter, Rennet, etc. (58.126e).**

These and other product ingredients shall be properly stored in a clean, dry room or area and protected against contamination. Storage of starter, color, and rennet in the cheese cooler is a satisfactory practice.

#### **B. Containers, Liners, Wrappers, etc. (58.241d).**

Check for sound construction of floors, walls, ceiling, doors, windows, etc. The room should be clean and dry and construction of the room, and fitting of doors should provide protection against rodent entrance.

Packaging materials shall be stored in their original protective container or wrapper until needed. Partially used, open containers shall be covered or resealed to protect supplies in the container from contamination.

Materials should be stored in an orderly manner on pallets, floor racks or shelves.

There shall be no space type fogging spraying for insects in the room which might contaminate the packaging supply.

C. Housekeeping (58.126e, 58.153).

Check that all supplies are stored in a neat orderly way and are so arranged on racks, shelves, or pallets to permit access to the supplies and allow cleaning and inspection of the room. Empty containers, unused items, or obsolete supplies should be disposed of.

D. Pesticides and Other Chemicals (58.153).

Check that insecticides, rodenticides, cleaning compounds, and other similar nonfood products are properly labeled, segregated, and stored in a separate room or cabinet away from milk, dairy products, ingredients, or packaging supplies.

**Item A34—Sanitary Practices (58.101e, 58.124, 58.129, 58.142, 58.145, 58.146a).**

A. Employee Sanitary Practices (58.129).

All employees shall wash their hands before beginning work and upon returning to work after using toilet facilities, eating, smoking or otherwise soiling their hands. They shall keep their hands clean and follow good hygienic practices while on duty. Expectorating or use of tobacco in any form shall be prohibited in each room and compartment where any milk, dairy products, or supplies are prepared, stored or otherwise handled. Examples of other unhygienic practices include: holding sanitary gaskets with the teeth, washing parts or equipment directly on the floor, and drinking from a water hose used for sanitary purposes (category C deficiencies). In the latter instance, check that the plant has provided sanitary drinking water facilities at convenient locations as required by §58.131b.

Clean white or light-colored washable or disposable outer garments and caps (paper caps, hard hats, or hair nets acceptable) shall be worn by all persons engaged in receiving, testing processing milk, manufacturing, packaging or handling dairy products. However, recommend that employees with long hair wear hair nets to completely envelop the long strands. Similarly, when facial hair is long enough to be considered a beard, recommend that a net or other suitable restraint be worn

B. Equipment Sanitizing Practices (58.101e, 58.146a).

Sanitizing is the application of steam, hot water, hot air, or other acceptable sanitizing solution of sufficient strength for an adequate time to effectively destroy all microorganisms on a clean product contact surface.

Food and Drug Administration (FDA) regulations applicable to sanitizing solutions are outlined in 21 CFR 178.1010, which lists the chemical names and combinations of chemicals that are suitable for use on food contact surfaces (the *General Specifications* reference 21 CFR 121.2547, which is not correct). In addition to compliance with FDA regulations, the

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manufacturer and seller of sanitizing solutions must register the formulation and labeling with the Environmental Protection Agency (EPA). The presence of an EPA registration number on the labeling therefore indicates that the product may safely be used as indicated by label instructions.

Pasteurized product contact surfaces shall be sanitized immediately prior to starting product flow. If this is not being done, recommend that a regular practice of sanitizing be initiated. Recommend sanitizing raw product contact surfaces of equipment after cleaning or just before use (a "should" item of §58.146).

Sanitizing with hot water shall involve at least five minutes contact with water 170°F or higher.

A specific sanitizing regimen is not required for spray dryers which are only dry cleaned between dryer runs. When wet cleaning is performed, check that thorough cleaning is achieved and that the drying system is thoroughly dried out immediately afterward. This can be accomplished by running the fans for a short period, using heat if necessary. Additional use of chemical sanitizing solutions is optional.

If plant personnel are observed washing or rinsing parts on the floor assign the deficiency to category C. Recommend the use of mats, buckets, racks, carts, etc.

### C. Product Handling Practices (58.145).

It shall be considered a category A deficiency when the survey reveals conditions whereby the product has been contaminated by foreign materials or where unwholesome products are processed or added to products processed for human consumption. Such conditions could be related to building deficiencies, unsatisfactory equipment, or operation practices.

#### Examples:

1. Leaking seals in an overhead agitator of a cheese vat that has allowed grease or oil to enter the product.
2. A serious condensation problem on the ceiling or overhead service lines that drips into an open cheese vat.
3. Equipment leaks, which allow cow water or other nonfood fluids to mix with the product.
4. Unsanitary handling or production practices which contaminates the product.
5. Floor scrapings from either butter packaging or cheese cutting operations being utilized for butter, butteroil, or process cheese production.

6. Reprocessing for human food of contaminated product containing grease, dirt, filth, or insects.
7. Use of moldy butter or bulk cheese for further processing without prior cleaning.
8. Use of salt or other ingredients contaminated with foreign material.

These deficiencies should be recorded under the appropriate item number. Therefore, example 1 would be recorded under Item C23—Make Vats & Agitators.

When the plant desires only “P” code approval, source plants for dairy ingredients need not be USDA approved. However, in any instance where products that have been rendered unwholesome are utilized for human food, regardless of the source of the products, the “P” code approval shall be denied and the INELIGIBLE status assigned.

Manufacturing and packaging operations of butter and cheese often result in a certain amount of “rework” such as butter or cheese which has seeped from forming heads or adheres to cutting frames, which has not been contaminated with unwholesome substances. This product can be reclaimed for human food and shall be clearly identified as product for human consumption.

Scrap that has been contaminated, comes in contact with floors, or has been removed during bulk product cleaning operations cannot be reclaimed for human consumption and shall be labeled as not for Human Consumption. If the scrap is not clearly labeled assign the deficiency to category C. Scrap shall be removed from the production area regularly. The waste shall be stored in an area or room in a sanitary manner and separate from edible butter, rework, cheese, or trim until disposal or removal from the plant. When handling, storage, or disposition of scrap is unsatisfactory, recommend corrective measures and assign the deficiency to the appropriate category. Reuse of the scrap as human food shall be considered a category A deficiency.

#### D. Sanitary Facilities (58.126e, 58.127c).

Hand washing facilities shall be provided. They shall be convenient, and they shall include hot and cold running water, soap, and sanitary single service towels or air driers.

All employees shall be furnished with a locker or other suitable facility where clothes may be changed and stored in an orderly manner. If there are any unused lockers, check them for cleanliness and evidence of trash, unused supplies, roaches, or other insects. When a laundry service is supplied or performed at the plant, the dirty laundry shall be kept in suitable containers.

When employees eat on the premises, encourage the provision of a lunchroom or special eating area (not mandatory). Check that such facilities are kept clean and orderly and have posted signs directing employees to wash their hands before returning to work.

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Any windows that can be opened shall be screened.

Doors to the rest rooms shall be self-closing and fixtures kept clean and in good repair. Also, check that the facilities are conveniently located and review construction and maintenance of floors, walls, ceiling, etc. Toilet rooms shall not open directly into any room in which milk or dairy products are processed, manufactured, packaged, or stored. Legible signs shall be posted in each toilet or dressing room directing employees to wash their hands before returning to work.

### Note:

Some companies prefer to locate the hand washing facilities directly outside of the rest room as this location affords better opportunity to supervise that hand washing is performed. There is no objection to this location provided that all the requirements above are met.

### **Item A35—Product Rinsings (58.145).**

Show NA for this item if the product rinsings are not saved or if they are recovered and not used for human food. When rinsings are saved for other than human food, the lines, pumps, and tanks need not be of sanitary construction, but this equipment should be maintained clean and not contribute to unsatisfactory sanitation, odors, insect control, or contamination in the processing rooms.

If compressed air is used to “blow down” either product or product rinsings, it shall have been produced in accordance with *3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products, and Product Contact Surfaces, Number 604-* .

Inspect the recovery and storage system for compliance with these conditions:

1. All water used in the recovery of product rinsings shall be potable or meet the requirements of process water (see the guidelines for Item A38—Water Supplies & Handling).
2. Pipelines, pumps, and equipment used for conveying rinsings from product lines or equipment to the rinsings storage tank shall comply with applicable 3-A Sanitary Standards requirements, including *3-A Accepted Practices for Permanently Installed Sanitary Product—Pipelines and Cleaning Systems, Used in Milk and Milk Processing Plants, Number 605-* for cleaning these transfer pipelines in place.
3. Product rinsings storage tanks shall be stainless steel and comply with applicable 3-A Sanitary Standards requirements.
4. Rinsings from raw milk or milk products shall not be stored in the same tank as rinsings from pasteurized milk or milk products, in order to avoid quality problems. However, storage in the same tank would be permitted if the mixture were promptly pasteurized or

suitably heat-treated to deactivate lipase. Should the plant wish to use this option in order to avoid having separate tanks, determine all relevant information about the kind of rinsings, percent fat content, percent total solids, kind of heat-treating or pasteurizing equipment, treatment time and temperature etc.

Raw whey and pasteurized whey rinsings may be stored in the same tank.

5. Rinsings from milk or milk products shall be handled in a sanitary manner to preclude bacteriological growth and be stored at 45°F or lower.

Raw or pasteurized whey rinsings shall be similarly handled and shall be stored at 45°F or less, or at 145°F or more.

The applicable storage temperature requirements may be waived if the milk or whey rinsings are promptly utilized, within 1 hour after collection, in a food product.

6. Product rinsings held in storage tanks shall be pasteurized prior to being adding to any product for further processing into a finished product.

In the event the plant wishes to add the rinsings directly to a product and then immediately pasteurize the mixture, obtain all details on the product flow and telephone the information to the National Field Director.

7. Product rinsings shall be collected as soon as practical after the product pipelines and equipment are emptied. Thereafter, the rinsings shall be handled and processed in such manner as to preclude quality problems in the finished product. If quality problems develop, the rinsings shall not be used for human food.
8. Branch tees and stubs from equipment to lines shall be kept short so as to assure adequate rinsing.
9. There shall be adequate control measures to assure proper flow to completely rinse the product from equipment and lines. Proper sizing of the pump to fill the lines, sufficient water pressure if flow is induced by potable water system pressure, sufficient rinsing time, etc.
10. The potable water supply of the plant shall be safeguarded against the introduction of product and product rinsings. This can be achieved by introducing potable water to the system only by methods permitted by the applicable plumbing code for the plant (two pipe diameters of open space between the supply line and the storage tank or use of a backflow preventer are the two most common methods).
11. The rinsings recovery system shall be designed and operated to preclude accidental commingling of cleaning or sanitizing solutions with the product rinsings.

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12. CIP or mechanical cleaning equipment, such as acid and alkaline cleaner solution tanks, outlet manifold piping at such tanks, and the primary solution circulating pump, shall not be used for potable water for product rinsings recovery and such equipment shall be completely separated by a physical break or a block-and-bleed system (see the guidelines for Item A3—Pumps, Pipelines, & Valves concerning block-and-bleed systems). Use of this equipment is precluded because of the danger of product contamination with cleaning compound residues.

However, there is no objection to using the water rinse tank of a CIP or mechanical cleaning system for storing potable water for recovery of product rinsings. (This would require an additional water pump in most instances since the solution circulating pump may not be used.) Likewise, cleaning solution pipelines meeting the 3-A Accepted Practices and spray devices in equipment may be utilized for conveying the potable water to equipment or product pipelines for collecting product rinsings. (In such case, the potable water could originate from a pump at the water rinse tank of a CIP or mechanical cleaning system or it might be introduced from a separate potable water line for distribution by water system pressure.)

13. In lieu of an automated or partially automated system for recovery of product rinsings, a potable water hose may be used to manually rinse bulk truck tankers, vats, storage tanks, etc., however, all preceding conditions in this instruction shall be followed.
14. The rinsings recovery system will be subject to inspection at each plant survey. Any problems with adulteration, public health, or quality of the finished product shall cause disapproval of the system. The inspector shall thoroughly review the plants system for such potential problems.

In addition, do not criticize the practice of “chasing” the product with a potable water rinse as soon as the equipment or tank is empty (where a holding tank for the rinsings is not utilized). If the rinsings enter a storage tank, they shall be pasteurized prior to adding them back into product (see number 6 above).

In instances where a product line is used intermittently throughout the day, a plant may rinse, with potable water, directly into a product vessel. For example, if a fines return line is rinsed every two hours with potable water, the water can go to the drain table, into a mixer/moulder, or cooker.

If a sanitizer is used, the rinsing shall go to the drain. In this instance they cannot be recovered for use in human food. Chlorine is often used to disinfect potable water supplies (at 2-5 ppm), however as a sanitizer the level is generally high enough to be readily detectable (100-200 ppm). If the plant is adding chlorine to the rinse water so that the level is above 10ppm, recommend that they discontinue the practice or divert the rinse to the drain. If immediate corrective action is taken, assign the deficiency to category D. If the plant cannot or will not discontinue rinsing with sanitizer, assign the APPROVED-3 Months status (category B deficiency). Failure to take corrective actions will result in the INELIGIBLE status (category A deficiency).

It is expected that utilization of product rinsings for human food will be a growing practice to avoid wasting suitable food and to reduce environmental disposal problems. When you encounter such systems, keep the National Field Director informed about the procedures employed, so that these guidelines can be periodically reviewed and updated as necessary.

**Item A36—Culinary Steam (58.127d).**

General Specifications, §58.127d, provides that culinary steam may be produced by 1) boiling soft water in a secondary steam generator or “reboiler,” or by 2) using only certain boiler water treatment compounds and following a system of steam purification per recommendations of the National Association of Dairy Equipment Manufacturers.

Although it is satisfactory, the first mentioned reboiler method is not widely used in the dairy industry.

The steam purification procedure referenced above has been superseded by the new *3-A Accepted Practices for a Method of Producing Steam of Culinary Quality, Number 609-*. Use it as your guide in checking new culinary steam installations. Existing installations which meet the former recommendations of the National Association of Dairy Equipment Manufacturers should be considered satisfactory because they are quite similar. However, in discussions with management, recommend that 3-A Accepted Practices be followed when any changes or new installations are made.

Here is a brief review of basic requirements for culinary steam systems to meet 3-A Accepted Practices:

1. When the boiler feed water is treated with chemicals, only those nontoxic compounds listed in FDA regulations, 21 CFR part 173.310 (which supersedes 21 CFR 121.1088 mentioned in the general specifications), may be used. Use of “soft” boiler feed water without boiler water additives is also satisfactory to make culinary steam. Such soft boiler feed water may be:
  - a. from a naturally soft supply
  - b. softened by an ion exchange or membrane process
  - c. steam condensate collected from heating equipment in the plant
  - d. suitable quality cow water from milk product evaporators.

If boiler water compounds are used, management should present a certification from the boiler water compound manufacturer that the compounds used comply with applicable requirements for steam which will be in contact with milk and milk products. Such certification may be in the form of a letter, or a statement on the product label or invoice. Check that the certification corresponds with the compounds actually in use. If management has no certification and is using steam for culinary purposes, check this item unsatisfactory and recommend that a compliance statement be obtained.

Note:

The “*List of Chemical Compounds Authorized for use under USDA Poultry, Meat, Rabbit, and Egg Products Inspection Programs*” is not helpful in determining suitability of boiler water additives for dairy use. Certain additives are permitted in boiler water for steam for contact with “food” which are not allowed if the steam is to contact milk or milk products.

2. Piping, trapping, strainers, etc. shall be in accordance with the text and illustrations of 3-A Accepted Practices. When deficiencies are noted, recommend correction.

A. Uses That Require Culinary Steam:

1. Steam injection into product hot wells for production of evaporated milk, sweetened condensed milk, NDM, etc.
2. Making Ricotta cheese with direct steam injection.
3. Steam injection into heating chamber of continuous pasteurizing or sterilizing equipment.
4. For direct heating of cheese in a process cheese cooker.
5. For direct injection heating of water to be recirculated in a continuous type Mozzarella curd mixer.
6. For direct injection heating of water to be added to melted butter in melting vats or at the separator during the manufacture of butter oil.
7. Any heating application where steam contacts the product.

B. Incidental Uses That Do Not Require Culinary Steam

1. Direct injection heating of CIP Tanks.
2. Direct injection heating of brine for treating parchment butter box liners.
3. Warm water from a steam-water hose station for rinsing of make vats.
4. For creating high humidity conditions in continuous salters for cheese curd.
5. For direct injection heating of water to make up neutralizer solutions for cream or other dairy products.
6. Steam sanitizing of pipes, tanks, etc., as often practiced in the manufacture of sweetened condensed milk.

7. Any use where there is no steam contact with the milk or dairy products.

For such incidental steam uses, the plant shall, as a minimum,

1. Use only those boiler water treatment chemicals which comply with FDA regulations, 21 CFR part 173.310, when the steam contacts dairy products.
2. Incorporate provision for purging the steam line. Just prior to use, the steam line should be opened for a short time to purge out any accumulated condensate or rust to the floor. For some systems which have rigid steam piping direct to the point of use, a separate bypass line and close-coupled shut-off valve will be necessary to accomplish such purging. Of course, the section of rigid piping which directs the steam into the product or product vessel must be made of stainless steel. The purging bypass and its valve should be located in the beginning of the stainless steel section or just upstream of it.
3. Occasionally the plant should check the suitability (cleanliness) of the steam at the point(s) of incidental use. One way of checking is to purge the line, then direct the steam into a bucket of clean cold water for approximately 5 minutes. Inspect the water for an oil "sheen, floating debris, odor, and perform a sediment test using the same procedures as for milk.

In case of doubt as to whether culinary steam is required or whether the "incidental steam use" requirements would apply for a specific use which is not mentioned here, contact the National Field Director for guidance.

#### **Item A37—Pest Control (58.147, 58.211, 58.247).**

##### **Insect Control in Dairy Manufacturing Plants.**

An effective program includes designating the responsibility of insect control to a specific employee. This employee should be trained and have general knowledge of insects, inspection and control procedures and proper insecticide application methods. This employee may manage all control efforts or oversee a commercial firm hired to aid in handling this responsibility. A primary concern is that approved insecticides are used in the proper areas and that application methods do not contaminate the product, equipment or packaging materials.

Although the goal should be insect-free conditions, particularly in processing rooms or areas, it is recognized that this goal may not be entirely attainable. Primary emphasis is to be placed on an effective pest control program which includes the following:

1. Maintaining clean premises which are substantially free of insect breeding places or harborages. These may include weeds, standing water, and dirty or uncovered waste containers.

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2. Sound building construction, tight-fitting doors and windows, screening of such openings, self-closing exterior doors, and use of air screens, streamers or other devices for keeping insects out. In addition, screen doors should open outward.
3. Use of intervention systems and killing insects outside the plant by using attractant baits, traps, electrical fly killers, etc.
4. Good housekeeping and cleaning practices to limit food supply. This includes timely waste removal during production, periodic cleaning of ceiling beams, light fixtures, and pipelines, keeping storage areas neat and clean, rotating supplies, etc.
5. A monitoring program that may include traps, glue strips, etc. This should also include trap cleaning and record keeping.
6. Follow-up procedures when pests are found.

When insects gain entrance despite these precautions, management should take steps to eradicate them. Following are the most commonly used commercial procedures:

### A. Use of Insecticides.

The EPA has responsibility for control and proper use of insecticides, rodenticides and fungicides. The enabling legislation is Public Law 92-156, the *Federal Environmental Pesticide Control Act of 1972*. EPA control is exercised over insecticide formulations by a system of required registration, approval, and review of labeling. Only properly registered and approved formulations may be sold and use must be strictly in accordance with the product labeling. Use of pesticides is restricted to "Certified Applicators," whose competence is reviewed under a system of either Federal or State certification as provided under the Act. The main types of insecticides used in dairy plants are as follows:

1. Knockdown type spraying for flying insects.

Such spraying is usually accomplished using steam or air pressure spraying devices or electrically driven "atomizer" fogging units. These so-called "knockdown" sprays, usually containing pyrethrum extracts and/or other materials not having residual killing action, may be used in processing areas during shutdown periods provided that exposed food products are removed or covered during spraying. Also, before processing the equipment and utensils shall be thoroughly cleaned and rinsed with water and should be sanitized to remove all traces of insecticide. Rinsing with water is not sufficient treatment following room spraying. Modern laboratory testing procedures are extremely sensitive in detecting insecticide residues.

2. Spraying or dusting with residual type insecticides (For roaches, silver fish, dermestids, etc.).

In contrast to the non-residual materials, there are residual insecticides which kill insects over a long period of time. A common acceptable way of applying residual insecticides in solution

is by use of the pressure type garden sprayer using a wand and fine stream nozzle for specifically directed application into cracks and crevices, behind electrical boxes, etc. Residual type insecticide powders may be applied in cracks and crevices with syringe type devices. Since the insects may be gradually affected, there is danger of dying insects falling into product or product vats, tanks, or other containers. There is no practical way to protect product during processing operations. Therefore, use of residual insecticides is limited to areas where products are never exposed during processing, packaging, handling, storage, etc.

### 3. Use of automatic insecticide dispensers.

Some aerosol spraying devices are available which automatically release a fine spray of insecticide into the surrounding area from a fixed position in the room. Pressurized cans of insecticide are often used, together with control and timing devices. EPA exercises control over the maximum amount of insecticide which may be emitted by such units during each 15 minute period. These units are usually sold, installed, and serviced by professional pest control companies. Such automatic dispensing systems shall not be used in processing or storage areas when products are being processed or stored in open containers. If automatic dispensers are used in these rooms during times when product is not exposed residual insecticides shall not be used, only the previously specified "knockdown" type insecticides may be used.

As with conventional spraying with these insecticides, exposed food products and packaging materials must be removed from the room or be protected. Afterward, equipment and utensils must be thoroughly cleaned and rinsed with water and should be sanitized before operations are resumed.

Automatic dispensing systems may be used in areas where there is no handling of exposed food without limitation on the time of operation, provided that sufficient precautions are taken to preclude entry of insecticide mist or affected insects into processing or storage areas through open windows, ventilating systems, etc. Under these conditions, either the aforementioned knockdown or the residual type insecticides may be used.

### 4. Use of baits.

For fly control purposes outside the plant, colored sugar baits made with approved insecticides may be used. Blue or green colors are preferred to clearly distinguish these baits from dairy cleaning compounds or edible food ingredients. Such baits should not be scattered indiscriminately outside the plant because of the danger of being tracked into the plant. Use of pans or other containers located up off the ground are recommended.

For roach control inside the plant, approved insecticide may be mixed with inert materials and be used as insect powders under circumstances which absolutely preclude contact with product. This means that the substances must be used in bait boxes under a system of control whereby strict accounting of all boxes can be accomplished so that all are removed prior to resumption of processing. They may be used in processing areas during shutdown only. The bait material should be colored green or blue. Routine use of baits for roach control is not a recommended practice. Control should be achieved by more conventional means of eliminating

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harborages, maintaining high level sanitation and proper spraying with residual type insecticides.

### B. Use of Electric Fly Killers.

These units consist of a charged grid to electrocute insects which attempt to alight. Some use special wave length lights to attract insects. They may be used outside the plant but are primarily installed inside the plant near doorways and other locations. They may be installed in processing rooms provided that: 1) they are not over nor near open vats or equipment, 2) they are equipped with catch pans for the dead insects, and 3) the catch pans are cleaned regularly. These units have limited effectiveness during daylight conditions but can be very useful in eliminating flying insects when left in operation during nighttime.

### C. Use of Vacuum-Type Fly Catchers.

Vacuum-Type Fly Catchers use an attractant light to lure the insects into a fast-moving air stream induced by a fan which deposits the insects into a filter bag. Such units may be used in processing rooms.

### D. Fumigation.

Fumigation, with FDA and EPA approved fumigant gas, is sometimes desirable for insect eradication. Perhaps the primary usage in the dairy plant is for cheese mite eradication from cheese drying rooms or storage rooms. Fumigation of Government-owned nonfat dry milk is also employed under certain conditions. Fumigant gas is extremely poisonous to man as well as to vermin; therefore, the entire fumigation procedure is under the direct control of a certified applicator. Effective fumigation requires that the building or room be tightly constructed, any cracks or openings must be taped or sealed, and the area exposed to necessary concentrations of the fumigation gas for a sufficient time to effect kill. The time necessary will vary with the temperature of the room, amount of fumigant used, amount of air circulation, type of commodity, method of storage, kind of insect and many other factors. It is the responsibility of the fumigator to assess these factors and adjust his procedures accordingly to obtain desired results. Usually, fumigation is handled by a certified commercial applicator working for a professional pest control company. It is also the fumigator's responsibility to protect the premises from entry during fumigation and to air out the room or building afterward. Do not enter fumigated rooms or buildings to check effectiveness of fumigation until you are certain it is safe to do so.

Because of the danger and high expense, fumigation should not be considered as a routine insect control method. It should be limited to circumstances where other remedial measures would not be practical or effective. Rather than becoming resigned to "repeat" fumigations, it would be more productive to concentrate on the reasons why the insect infestation occurred and on correcting relevant deficiencies. For instance with mites, effective preventative control can be achieved with proper construction of rooms and shelves, good sanitation practices, maintenance of low humidity conditions, and careful inspection of cheese put into the rooms.

#### E. Special Considerations for Cheese Mites.

To check for mite infestation, use a magnifying flashlight (5 or 10 power). Check shelves, tables, walls, rusty areas of conveyors, stored cheese, floor sweepings, etc. Also check cheese tables for mites at the liner-jacket overlap, crevices in the agitator attachment, name plate, etc. Cheese mites are small, slow moving, and nearly transparent (somewhat like little sacks of water). If you have any questions contact the National Field Office to discuss your observations.

When live mites are noted, recommend elimination and also show some details about the extent of the infestation. Where the problem is widespread in the room, fumigation is usually employed. Where only a limited area is infested, the affected location may often be treated successfully by scrubbing and hot water treatment. If this is done while the survey is in progress, check the area afterward and show all the relevant information on the report.

Mite infestation is greatly discouraged by sound construction free of crevices, by clean conditions, maintenance of low relative humidity and careful inspection of any aged cheese or used boxes brought into the room. If repeat infestations occur, management would be well advised to correct the basic cause.

#### F. Special Considerations for Dermestid Insects.

For proper dermestid insect control, frequent use of the heavy duty vacuum cleaner should be made with special attention given to ducts, switch boxes, conduit boxes, motors, conveyors, cabinets, pipes, lights and tops of beams and supports. For further guidance, the following items should be carefully checked:

1. Any overhead ledges, beams, cross-bracing, and skylight areas should be vacuumed and kept reasonably free from dust.
2. Ventilation ducts and air-conditioning units should be mounted to allow sufficient clearance for cleaning.
3. Electrical panels should be mounted flush and sealed around the perimeter or be mounted with spacers about two inches from the wall.
4. Pipe service openings through walls should be smoothly cemented or have metal sleeves and sufficient clearance to facilitate thorough cleaning.
5. Enclosed stair wells which result in "dead space" or use for storage are a potential trouble area. Inspection emphasis should be on good lighting and racks or shelves to facilitate good housekeeping.
6. Vertical ducts are preferable for exhaust of air from dryer or packaging rooms. If horizontal ducts are present, provision should be made for easy access for periodic cleaning of powder dust from inside surfaces.

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7. Open pipes which are used for handrails, ladders, etc., should be capped or welded shut at each end.
8. All pilasters and concrete or tile block walls should be sealed on top to prevent dust or insect entrance.
9. Fluorescent lights do not generate much heat and, therefore, may support insect infestation inside the fixture or on top of the reflector. Inspect carefully for powder accumulation or insects. New or replacement fixtures should be sealed type.
10. False ceilings can cause serious problems with dermestid insect control particularly if there are perimeter cracks or other ceiling openings for pipes, pipe supports, service ducts, etc. Such openings can allow powder dust to enter and support dermestid insects in a "protected environment." The larvae and insects can then fall to various areas of the equipment or room below and start secondary infestations.

If the "false" ceiling space is deep enough to permit worker entry, insect control can be reestablished by vacuuming all areas and then spraying regularly with residual type insecticide. When the false space is shallow, it may be necessary to provide removable access ports for cleaning and spraying, or in some instances, removal of the false ceiling may be required. Exposed beams or joints do not constitute unsatisfactory construction in a dry milk operation. As contrasted to fluid processing rooms, wet cleaning is seldom necessary and there are entirely different circumstances with respect to ventilation and vapors, etc. However, exposed ceiling surfaces preferably should not have horizontal ledges. Such ledges often gather product dust and allow dermestid infestation in much the same way as a false ceiling.

### **Rodent Control in Dairy Manufacturing Plants.**

The basic principles for rodent control are very similar to those outlined for insect control, that is, maintenance of clean premises free of harborages, tight plant construction, rodent proofing exterior openings, use of metal doors and/or metal flashing, etc. Inside the plant, means should be continuously employed to eradicate any rodents which might penetrate the perimeter barriers. Here are some commonly used control methods:

#### **A. Use of Rodenticide Baits.**

In general, rodent baits should be used only in nonprocessing areas. The only way they may be used in processing rooms would be during shutdown periods and with strict accounting of the location and number of baits set out. All would have to be removed before operations are resumed.

Baits should not be strewn about loosely or be placed out in open paper saucers or cups. Ideally, they should be dispensed in metal bait boxes, although wooden or solid fiberboard construction would also be satisfactory. If prepackaged baits in paper bags are used, care should be exercised in their placement so that bags are not broken by traffic, forklifts, pallets,

etc. The loose bait could be tracked around the plant or cause a messy appearance. Regular plant checking would also be necessary to clean up any bait bags opened by rodents. In short, this bag method of dispensing baits is subject to misuse. If this is noted, recommend that enclosed bait boxes be used.

Rodenticides ordinarily do not have an insecticide effect. Insect infested baits are frequently encountered and this can be a serious problem in dry milk plants when the insects are dermestids. For dry milk plant use, therefore, rodent baits should be specially treated with residual insecticide to avoid this problem. (Light treatment with Malathion is a common practice. Bait acceptance may be somewhat reduced.)

Whether baits are used by a commercial firm or are set out by company personnel, it is important that they be serviced frequently to be effective. Moldy, neglected baits in the wrong location will serve no useful purpose and could constitute a housekeeping and appearance problem.

#### B. Use of Mechanical Traps.

These may be baited or unbaited, spring-actuated traps which usually kill the rodent. If such traps are used, they must be checked regularly to remove the catch and avoid odor or insect problems. Naturally, if frequent catches are made, extensive checks should be made to review effectiveness of the perimeter control measures or determine if there is a breeding resident population.

#### C. Use of Windup Type Repeater Mechanical Traps.

These box-like contraptions have a spring-wound, revolving, bladed wheel which kills the rodent and flips it into a closed compartment and is automatically reset to repeat the process.

As with conventional traps, they must be regularly tended. The person responsible should maintain a record of trap placement so they are not inadvertently missed.

### **Category Assignments**

When evidence of insects, rodents, or other vermin is observed during a survey, a full and complete review and evaluation of the pest control program shall be conducted. The pest control program should include two goals. First, to exclude pests from the premises and second, to eliminate all pests that infiltrate the premises. When assigning a category to this deficiency, consideration shall be given to how well the pest control program meets these two goals rather than on specific pests observed in the plant. To be categorized as a category A deficiency an infestation must be present, and there must be a breakdown of the pest control program. An infestation consists of multiple findings of a pest or pests. In addition, gather all relevant information and contact the National Field Office before discussing status assignments with the plant.

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The Dairy Grading Branch has specified the following category assignments for specific deficiencies.

### A. Rodents.

Evidence of a rodent infestation in a processing room, or storage areas for product, gaskets, or packaging supplies indicates the plant does not have an effective control program (for example, rodent excreta is found and outside entrances are not effectively protected, premises are cluttered with junk, no in plant controls in use, etc.). Show all relevant details on the survey report and assign this deficiency to category A.

When only isolated evidence of rodents is found in a room that does not open directly into a processing or product storage area (a remote area) and the plant has a good control program, the deficiency can be assigned to category B. In such cases, arrangements shall be made for the immediate removal of all rodent evidence and cleaning of the affected areas.

A rodent found in a bait box or trap indicates the pest control program is effective but more diligent follow-up is required, therefore this deficiency should be assigned to category C. Make a recommendation on the report for increased vigilance with the control program.

### B. Flies.

A fly infestation in areas where product is exposed, or flies noted in or on pasteurized product indicates the plant does not have an effective pest control program. Before assigning this deficiency to a category it is important to evaluate the seriousness of the problem (the number and location of the flies), the reason(s) for the presence of the flies (open doors, ineffective screening, etc.), and the immediate corrective measures taken by the plant. If flies are noted in pasteurized product, or if the problem stems from severe shortcomings in the pest control program, assign the deficiency to category A. When a limited number of flies are noted in a processing or packaging area (but not in the product) the deficiency can be assigned to category B or C (category D is applicable only if the problem is in an area remote from exposed products).

### C. Roaches.

When a roach infestation is observed in a product processing, packaging, or storage area assign this deficiency to category A. Consideration should be given, however, to the plant insect control program. If live roaches are observed, this obviously indicates inadequate control. If, on the other hand, only isolated instances of dead roaches are noted and the plant has an insect control program, judgement should be used in assigning this deficiency to a category, with emphasis on cleaning up such insect evidence.

D. Cheese mites.

The presence of a cheese mite infestation in a cheese operation is a category A deficiency. However, if the infestation is limited to a very small area that is immediately cleaned, and the mites are not found on the cheese, this deficiency can be assigned to category C. The condition and correction shall be described in the report and a recommendation made to prevent recurrence of the problem and for closer attention to insect control procedures.

E. Dermestid insects (Carpet beetles, cabinet beetles, etc.).

Live dermestid insects (either larvae or adult stages) found infesting a dry milk plant or its warehouse where packaging supplies and finished products are stored shall be considered a category A deficiency. The INELIGIBLE status applies until resurvey shows elimination of insects, including all cast larvae skins.

When a survey reveals only dead insects or cast larvae skins in a processing or packaging room and a thorough inspection of the plant turns up no live insects, and management arranges for immediate cleaning of all insect evidence during the survey, this deficiency can be assigned to category B.

When a survey reveals live dermestid insect infestation in a very limited area which is remote from the processing and packaging operations, the finished product warehouse, and storage areas for packaging supplies, and management corrects the problem immediately during the survey, this deficiency can be assigned to category C.

In all cases mentioned, the report shall show the full details of the infestation, the management response, and a recommendation for closer attention to insect control procedures. Also, send specimens to the National Field Office in a small plastic or glass vial (plastic preferably—ask the plant to supply a universal vial normally used for the raw milk samples or purchase a vial from a drug store). Put a small amount of alcohol in the vial, if any is available, and attach a label showing the name and address of the plant, survey date, and your name.

F. Other insects.

When insects other than flies, roaches, mites or dermestids are noted during a survey, the inspector should make detailed checks to determine the extent of the problem. Consideration should be given to the type of insect, potential as a product contaminant, and area of plant where found. Call the National Field Office if you have any questions.

**Item A38—Water Supplies & Handling (58.127a, b, 58.217).**

**Sanitary Water Supply**

There shall be an ample supply of hot and cold water of safe and sanitary quality, protected against contamination, with adequate facilities for proper distribution throughout the plant. Water from other facilities, such as evaporators, may be used for boiler feed water and

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condenser water provided that such water lines are completely separated from the potable water lines, the equipment is constructed and controlled to preclude contamination of product contact surfaces, and the system is officially approved (see the sections on cow water and process water). There shall be no cross connection between potable water lines and nonpotable lines or between public and private water supplies.

Bacteriological examinations shall be made of the plant's sanitary water supply on samples taken at the plant at least twice yearly or as often as necessary to determine safety and suitability for use in manufacturing dairy products. The results of water tests shall be kept on file at the plant for which the test was performed. Show on the report the date of the latest tests on the water supply. If the test is more than six months old, recommend retesting.

Plants on a municipal water supply may draw the sample, but must have the test done at a State or EPA approved laboratory.

Plants with their own well must have the sampling and testing done by the State Regulatory Agency, or a local health officer. The location, construction, and operation of the well shall comply with regulations of the appropriate agency.

### **“Cow Water” Handling.**

Among other requirements, §58.217 of the General Specifications outlines the permitted and prohibited uses of condensed water vapors which are removed from milk or dairy products during the process of vacuum evaporation. Such hot water recovered after extraction from the milk is termed “cow water.” When a modern multiple effect evaporator is used, the moisture vapor withdrawn from the milk is usually piped to the tube chest of a subsequent effect or to product preheaters. These hot vapors are used to heat product and in this process of giving up heat are condensed into hot condensate, or cow water. Since the moisture vapors are drawn from the milk product at high velocity and with considerable surface turbulence, it is normal that this cow water contains some entrained product solids. The amount of entrainment can vary widely depending on the design of the evaporator and its vapor separators, kind of dairy product, rate of evaporation, skill of the operator, start-up conditions, vacuum leaks, malfunctions, etc.

The entrained product solids can support subsequent bacterial growth under appropriate conditions of time and temperature. For this reason, cow water is considered nonpotable and it may not be intermixed with dairy products, for instance, by rinsing product and foam from tanks for an edible product, chasing milk from pipelines or evaporator, etc. It may not be used as final rinse water, acidified rinse water, or for makeup of sanitizer solutions for product contact surfaces after cleaning is completed.

### Notes:

Cow water should not be confused with steam condensate from steam heaters or from first effect evaporator tube chests which are heated only by steam. If the first effect is heated by a combination of direct steam and recompressed milk vapors

from a subsequent effect, the hot water from the first effect tube chest is a mixture of steam condensate and cow water and must therefore be handled as cow water.

Cow water is not tail water from an open type condenser. Such tail water contains only a small proportion of condensed vapors from the milk, and the temperature of the mixture is relatively low. Although it is frequently cooled and recycled as condenser water, it is seldom used for other purposes in the plant.

Permeate from reverse osmosis (RO) membranes, if reused within the plant, shall meet the requirements of this section except as noted below.

Permeate from ultra-filtration (UF) membranes contains milk constituents and cannot be used as a water supply without further processing.

Process water is cow water or RO permeate that has been treated so that it is safe to use in instances where cow water is not (addition to products, sanitizer makeup water, etc.).

Cow water can be utilized for prerinsing equipment or pipelines to the drain, for makeup of either alkaline or acidic cleaning solutions for washing equipment, for hose stations used for cleaning floors, exterior of trucks, exterior surfaces of equipment, etc. However, the following restrictions apply:

1. Pipelines, pumps, tanks, etc. for handling cow water must be completely separate from plant or city potable water systems with no cross-connections which would permit contamination of the potable supply. Where potable water to cow water interconnections are necessary, there shall be a break to atmosphere or use of an approved backflow preventer in accordance with applicable plumbing codes.
2. The amount of milk solids entrainment in cow water shall be monitored by turbidity or conductivity instruments mounted in the lines from the various collection points on the evaporator system. Sensitivity of these instruments can be adjusted and they can be wired to operate divert valves to direct the cow water to the drain when the organic content is in excess of 12 mg/l (or standard turbidity in excess of 5 units). Such continuous monitoring and automatic diversion of unsuitable water is not required when the cow water is reused for boiler feed water, in boilers not used to generate culinary steam, in a raw product, thick, double walled, enclosed heat exchanger, and in a RO permeate line.
3. The water, if not used immediately, may be stored using pipes and tanks constructed of stainless steel, iron, coated iron, fiberglass, or any other nontoxic material suitable for water handling (see item 4 for the temperature requirements of stored cow water). The tanks should have means of drainage, and means of access for required periodic cleaning. (Frequency of cleaning cannot be precisely specified—will depend on water quality, frequency of emptying, etc.).

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Insulation of the tanks may be desirable to retain water temperature if the tanks are located outdoors.

Elevated locations are commonly used to provide gravity pressure for plant distribution.

When there is a shortage of hot cow water for desired plant uses, potable water may be introduced into the cow water tank. This is a satisfactory practice if the potable water is introduced in such manner that there is no possibility of cross-contamination of the potable water supply.

4. The temperature of stored cow water shall be maintained at 145°F or higher by automatic means.

Any necessary supplementary heating may be with steam injection, heating coils, etc. The amount of such heating required depends on tank insulation, and initial temperature of the cow water mixture. The hottest water (150-170°F) originates from the initial effects of the evaporator. Water from subsequent effects is at progressively lower temperatures. Cow water from the final effect or from a closed type condenser might be approximately 110-130°F. (The main determinants of original cow water temperature are the design of the evaporator and the temperature and amount of condenser water used.)

In lieu of maintaining the water at 145°F or higher to prevent bacteria propagation as outlined above, bactericides such as chlorine may be used. If this alternate approach is employed, an automatic proportioner shall be provided to add the bactericide to the water before it enters a storage tank.

There is no special 145°F heating or bactericide treatment requirements for cow water which does not enter a storage tank.

5. Cow water piping shall be free of dead ends. Water in such dead end piping would quickly cool down and permit excessive microbial growth. To prevent cooling of water in piping distribution systems, the lines may be insulated and/or make a complete circuit back to the supply tank for natural circulation.

Cow water shall not be piped to plant distribution locations where there is danger of improper use, such as introduction into dairy products or final rinse of cleaned equipment.

Cow water should be piped only to distribution and use points in the plant where there will be frequent, regular utilization. (Intermittent use might allow excessive bacteria development in the cooled-down water stored in the long "dead ends" formed by the distribution piping.)

6. The responsibilities for collecting and handling of cow water, cleaning of tanks, etc. should be clearly established by plant management. The procedures should be monitored by bacteriological testing as necessary to assure proper control.

7. Distribution lines and hose stations are to be clearly identified as Cow water systems and not suitable for use in product.
8. Cow water handling practices and guidelines are prominently displayed on employee bulletin boards, lunch room walls or locker room walls.
9. Cow water lines are not permanently connected to product vessels unless there is a break to atmosphere and sufficient automatic controls to prevent the inadvertent addition of cow water to product streams.

These restrictions on the use of cow water are due to its nonpotable classification. It is technically possible to purify and treat any water (including cow water or RO permeate) to make it safe. This, however, would require rigorous control and routine laboratory testing of the factors which determine water safety. (SPC, coliform, organic content, chemical quality, organoleptic quality, use of approved chemicals.) If management is interested in this approach, suggest contact with the National Field Director who can supply guidelines for the monitoring and testing involved. See the guidelines for Process Water below.

If cow water is used exclusively for boiler feed water in boilers not used to generate culinary steam, or in thick-wall type heat exchangers (tube in shell), it is not necessary to check on any of the previous points. In such instances, control of the cow water is primarily for engineering, not sanitary considerations. Cow water relatively free of entrainment is required to avoid serious boiler operation problems.

Reuse of cow water in the plant has a number of economic advantages:

1. Savings on amount of fresh water needed to operate the plant.
2. Sewer charge savings.
3. Energy savings from recovery of heat in the water for useful purposes.
4. Reduced amounts of boiler treatment compounds are needed when cow water is used for boiler makeup water. (Quite soft.)
5. Less cleaning compounds needed to make up cleaning solutions.

For these reasons, plant use of this water is expected to increase. If you have questions about proper procedures for collecting and handling it, consult with the National Field Director before making recommendations. Use this item to show recommendations when applicable.

Examples:

- A38. — Maintain cow water tank temperature at 145°F or higher (cow water tank currently at 140°F) (D).

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- A38. — Provide a sensor device to monitor cow water collected from the first and second effects of the evaporator to automatically divert unsuitable water (now monitored only visually by the evaporator operator who manually diverts it at start-up or when cloudy) (C).

### Process Water

Acceptable process water is water recovered from processes such as evaporation or membrane processing and subsequently handled and treated in such a manner that it can be considered a safe water supply. Acceptable process water, in addition to municipal water and potable private water systems, is suitable for intermixing with products for human consumption in certain specified applications. USDA-Dairy Programs will accept the use of process water in applications where it is intermixed with products for human consumption when the following requirements are met:

1. The process water collection and handling system shall meet all of the applicable requirements for cow water handling in this item.
2. The process water system shall be maintained completely separate and free of cross connections to municipal or private potable water systems.
3. The State Regulatory Agency shall determine the criteria to be used to determine the acceptability of the process water. The criteria shall be either the microbiological, chemical, radiological, and physical criteria as set forth in the National Drinking Water Regulations of the Environmental Protection Agency (40 CFR Parts 141-143), or Appendix D, Section V, of the Grade A Pasteurized Milk Ordinance, 1999 Revision.
4. The responsible State regulatory authority shall provide written acceptance of the process water. The State need not certify the water as "potable," only that it is safe for intermixing with food products for human consumption. The state acceptance letter shall state the criteria to be used to accept the process water and shall identify the specific applications where the process water is acceptable to be used.
5. The plant shall follow any sampling and testing regimen the State Regulatory Agency deems necessary and maintain the State requirements and have all pertinent records on file and available for inspection.

If a plant is intermixing process water with products for human consumption, check to see that a letter of acceptance from the State Regulatory Agency is on file, and make a cursory check of the water test records to ensure that the plant is following the State prescribed testing regimen. If the letter of acceptance is not on file, or the plant is not following the prescribed testing program the INELIGIBLE status shall be assigned (category A deficiency).

If the letter of acceptance is on file but lacking either 1) the criteria of the prescribed testing program to be used to determine the suitability of the process water or 2) specific applications

where the process water can be intermixed with products for human consumption, assign the deficiency to category B.

### **Nonpotable Heat Exchange Media**

When applicable, report on nonpotable heat exchange media such as cow water, cooling tower water, sweet water, RO permeate, glycol, etc. used as heat exchange media in plate and other type heat exchangers, processing vats, cheese vats, cold-wall tanks, etc. It is not necessary to make special checks if the plant is only using a potable water supply for this purpose.

Since the potential exists for intermixing of the heat exchange media and product due to cracks or pinhole leaks, the following criteria shall apply.

#### **A. Inspection of Systems Which Use Nonpotable Heat Exchange Media.**

Visually inspect the heat exchange media systems. This may include sweet water, brine, glycol, cow water, or cooling tower water. All systems are to be structurally sound, free of leaks, and holding tanks shall be equipped with covers. The covers should be tight fitting, overlapping, and have a downward flange  $\frac{3}{8}$  inch long, or have a gasketed flange, to prevent the entrance of contaminants into the system.

Cow water systems are to be inspected utilizing the criteria set forth in this Item. Cow water systems complying with these criteria and used for single pass heat exchange purposes are acceptable.

#### Examples:

1. Cow water from the evaporator is collected in a storage tank according to the requirements of this Item. Cow water from this tank is used to preheat product in a plate heat exchanger with the cow water then going to drain. Other uses for cow water such as hose stations, CIP pre-rinse, or CIP solution makeup may also be drawn from the storage tank.
2. Cow water from the evaporator is collected in a storage tank according to the requirements of this Item. From this storage tank, cow water is used to preheat product in a tubular heat exchanger, then piped directly to a plate heat exchanger used to preheat product, then goes to drain.

It is not acceptable if recirculation or bypass lines are included in the system to return cow water, which has been used to preheat product, back to the storage tank.

Atmospheric tower water systems are not acceptable for use as heat exchange media for direct cooling or heating of product across a single, thin walled heat exchanger surface such as a plate heat exchanger. Such recirculated tower water is acceptable for use in thick walled heat exchangers, such as a shell and tube heater or for nonproduct cooling or heating purposes such as for evaporator condensers of either the direct or indirect types.

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Any water treatment chemicals (i.e., freezing point depressants, rust inhibitors, etc.) must be nontoxic and of food grade quality. For preparing glycol solutions, propylene glycol may be used, but not ethylene glycol. Check container labels of the water treatment additives. If they do not bear a declaration of food grade quality, ask plant management if they have a letter from the chemical supplier certifying that the additives are food grade quality. When no ingredient quality statement or label is available, make a recommendation that only safe, nontoxic food grade additives shall be used and that appropriate documentation shall be obtained and maintained on file.

### B. Testing Requirements for Nonpotable Heat Exchange Media.

A minimum of two coliform tests per year shall be performed on each nonpotable heat exchange media system, including cow water systems, but excluding tower water systems, in the plant.

Coliform tests shall be routinely performed on samples taken by a Federal, State, or local regulatory authority with the tests conducted in the USDA or an official State laboratory. The results shall be on file at the plant. Show on the report whether the most recent results were satisfactory or unsatisfactory and the date of the test. If results are not on file, or if the report is dated more than six months old, recommend retesting.

Should a test report reveal that unsatisfactory levels of coliform organisms are present, the APPROVED-3 MONTHS status shall be assigned (category B deficiency). Inform them that the rating is being assigned due to cooling media quality. Recommend that the system(s) be inspected for defects, cleaned, and sanitized within the 3-month period so that subsequent test results will be satisfactory. Failure to eliminate the unsatisfactory coliform count will result in the INELIGIBLE status (category A deficiency).

### C. Acceptable Results for Coliform Bacteria Tests.

Cooling media samples are to be tested for coliform bacteria in accordance with the test procedures identified in the most recent edition of *Standard Methods for the Examination of Dairy Products*. Testing is to be by either the Most Probable Number (MPN) method or the Membrane Filter method.

Test results will be considered as satisfactory if they meet the following criteria:

1. Most Probable Number (MPN) - less than 2.2/100 ml. (often reported as <2.2).
2. Membrane Filter Method - less than 1/100 ml. (often reported as <1).

### Item A39—Alternate Fats.

All USDA Approved plants, listed in Section I, that manufacture or package margarine, butter/margarine blends, imitation cheese products, filled evaporated milk, or other products

which utilize fats other than butterfat shall have their dairy products sampled and tested for alternative fats by USDA.

During each survey (except for a timely follow-up survey after the assignment of the INELIGIBLE, NO STATUS ASSIGNED, OR PROBATIONARY-10 DAYS status) select one sample that is a minimum of ¼-pounds, or one can of evaporated milk, from current production or product that is in the cooler. The properly prepared sample shall be sent to the Science Division Western Regional Laboratory in Chicago for testing.

On the survey, leave this item blank, the results will be filled in by the National Field Office as appropriate.

Prepare a DMS report listing the applicant, product, churn, vat or subplot number. In the remarks section, write "TEST FOR ALTERNATE FAT." The applicant shall be charged for the time spent selecting, preparing, and testing the samples. Include the charges in the total fee, expense, and laboratory charges for the survey.

Seal the original and 1 copy of the DMS along with the sample(s) in a polyliner using a grip-lock seal, then seal the polyliner in a shipping carton using evidence tape. The plant is responsible for mailing or shipping the samples to the lab. Leave one copy of the DMS with the plant. Send a copy of the DMS along with the plant survey report to the National Field Office.

**Item A40—Plant Exterior & Premises (58.125, 58.126a, 58.127f, 58.146d).**

**A. Plant Surroundings (58.125, 58.126a, 58.146d).**

Check the immediate surroundings for unsatisfactory conditions such as: the presence of rubbish; high weeds or grass; surplus equipment near the plant and adjacent areas; freedom from strong or foul odors; excessive air pollution or smoke; etc. In the broadest sense, the term "immediate surroundings" might be defined as extending to the boundaries of the site under control of management. However, some judgment must be exercised. The primary emphasis should be the checking of areas close to the plant entrance and other openings for good housekeeping.

There may be instances, however, where unsatisfactory conditions are noted in the immediate surroundings that are not under the direct control of management.

Example:

Bad odors or dusty conditions emanating from an adjacent farm or factory.

Besides aesthetic considerations, such adjacent areas might be sources of air contamination causing a bacterial problem in the plant or product. For instance, such environmental conditions may be a factor in salmonella control at dry milk products plants. Adjacent areas housing poultry, pigs, pigeons, etc., are unsatisfactory and recommendations should be made

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for eliminating potential sources of contamination from the proximity of the plant. The recommendation may be helpful to management in obtaining correction.

Check the plant facilities for sound construction and good maintenance. Make recommendation for any needed repairs or painting. When very extensive repairs are needed, the recommendation may be for needed repairs or replacement with a new structure suitable for dairy processing. Do not cover plant interior deficiencies under this item, handle them in the report section dealing with the particular room or area.

Inspect all outside wall openings to determine if they are properly protected to prevent entrance of rodents, birds, insects, etc. Self-closing flaps should be checked for proper operation. When deficiencies are noted make recommendations for corrections.

Plant driveways and adjacent plant traffic areas should be hard surfaced with concrete, asphalt, or similar material to keep dust and mud adjacent to production or intake areas to a minimum.

The grounds around the plant should be properly graded or otherwise provided with a satisfactory drainage system to drain surface water rapidly away from the plant. Such water "shall be disposed of in such manner as to prevent an environmental or health hazard." Do not criticize properly engineered holding ponds.

Usually the surface water (primarily rain) presents no particular disposal problem on a properly engineered site. It is disposed of by seepage, runoff and storm sewers. Disposal of drainage that may contain milk or other product spillage (as from an uncovered truck loading or unloading area) is another matter. These drains shall be connected to a sanitary sewer.

### B. Solid Waste Storage & Disposal (58.127f).

Containers for collection and holding of plant wastes shall be made of metal, plastic, or other impervious material. They shall have tight fitting lids and be kept covered while temporarily stored outside the plant prior to pick up. This does not preclude the orderly storage of cardboard bales outside the plant, provided they are picked up regularly. Also check that solid wastes are disposed of regularly and that containers used inside the plant are maintained in acceptable condition and cleaned before reuse.

## Exhibits

Exhibit A1

U. S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE		NAME AND ADDRESS OF PLANT SURVEYED <b>DUXBURY CREAMERY</b> <b>DUXBURY, MN</b>	
MILK QUALITY - DMCC SLIDES		TYPE OF PLANT (Product Manufactured) <b>MILK RECEIVING</b>	

  

SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1			
2			
3			
4			
5			

  

REMARKS:

NO SAMPLE. PLANT IS ON REDUCED TESTING

  

NAME AND ADDRESS OF INSPECTOR <b>SAM PLING HOLSTEIN, IA</b> <small>SIGNATURE OF INSPECTOR</small> <b>Samatha Pling</b> <small>DATE OF INSPECTION</small> <b>10/27/97</b>	NAME AND ADDRESS OF LABORATORY  <small>SIGNATURE OF LABORATORY TECHNOLOGIST</small>  <small>DATE</small>
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FORM DA-144 Edition of 4/78 may be used  
(MAY 86)

## DA INSTRUCTION NO. 918-PS

Exhibit A2

U. S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE		NAME AND ADDRESS OF PLANT SURVEYED RIB LAKE CHEESE CO. RIB LAKE, WI	
MILK QUALITY - DMCC SLIDES		TYPE OF PLANT (Product Manufactured) CHEESE	
SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	RT 2 GRADE A	38°	
	HOLD OVER		
2	RT 3 GRADE A	38°	
	HOLD OVER		
3	RT 5 GRADE B	44°	
	FRESH, FROM DUXBURY CREAMERY		
4			
5			
REMARKS:			
NAME AND ADDRESS OF INSPECTOR DREW A. SAMPLE, MAXVILLE, WI		NAME AND ADDRESS OF LABORATORY	
SIGNATURE OF INSPECTOR Drew Sample		SIGNATURE OF LABORATORY TECHNOLOGIST	
DATE OF INSPECTION 10/27/97		DATE	
FORM DA-144 Edition of 4/78 may be used (MAY 86)			

Exhibit A3

U. S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE		NAME AND ADDRESS OF PLANT SURVEYED NICE BUTTER CO. NILE, CA	
MILK QUALITY - DMCC SLIDES		TYPE OF PLANT (Product Manufactured) BUTTER, POWDER	
SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	Silo 1	38°	
	IN AND OUT SYSTEM		
	9:30		
2		40°	
	11:00		
3		40°	
	1:30		
4			
5			
REMARKS:			
NAME AND ADDRESS OF INSPECTOR R. U. DRIPPING LIKELY, CA Signature of Inspector: <i>Ralph Dripping</i>		NAME AND ADDRESS OF LABORATORY	
DATE OF INSPECTION 12/27/97		SIGNATURE OF LABORATORY TECHNOLOGIST	
		DATE	

FORM DA-144 Edition of 4/78 may be used  
(MAY 86)

## DA INSTRUCTION NO. 918-PS

Exhibit A4

U. S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE		NAME AND ADDRESS OF PLANT SURVEYED RED & WHITE MILK HAULERS MOOVILLE, NY	
MILK QUALITY - DMCC SLIDES		TYPE OF PLANT (Product Manufactured) MILK RECEIVING	
SAMPLE NUMBER	IDENTIFICATION	TEMPERATURE OF MILK	FOR LABORATORY USE DMCC
1	TANKER 007 GRADE A 50,000 lbs	44°	
2	SAME AS 1		
3	SAME AS 1		
4			
5			
REMARKS:			
NAME AND ADDRESS OF INSPECTOR E. Z. DOESIT, BREAKABGEN, NY		NAME AND ADDRESS OF LABORATORY	
SIGNATURE OF INSPECTOR Earl Doesit		SIGNATURE OF LABORATORY TECHNOLOGIST	
DATE OF INSPECTION 10/27/97		DATE	
FORM DA-144 Edition of 4/78 may be used (MAY 86)			